CCD-V5 / V50

SERVICE MANUAL

US Model
Canadian Model
CCD-V5

E Model
CCD-V50

AUTO Handycam
Video 8

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 1.43 cm/sec. LP: Approx. 0.72 cm/sec. (playback only)
Recording or playback time	120 min. (P6–120)
Fast forward time	Approx. 6 min. 45 sec. (P6–120)
Image device	CCD (Charge Coupled Device)
Viewfinder	VF-239 electronic viewfinder (0.7" black and white)
Lens	Combined 6 × power zoom lens f = 12–72 mm, F1.6 with macro Filter diameter: 46 mm
Auto focus system	TCL
Colour temperature	Preset values: ☀ 5,800K ☼ 3,200K Auto: From the light at a tungsten lamp to the light on a slightly overcast day.
Minimum illumination	9 lux
Illumination range	9 lux–100,000 lux (0.8–9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, −10dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5V DC, for the RFU-88UC only
MIC jack	Minijack, −66 dBs, low impedance With 2.5–3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Mode: REC/STBY
INDOOR/OUTDOOR
BACK LIGHT
Caution: BATTERY
DEW
TAPE END
CASSETTE
LOW LIGHT
CAUTION
Time/date indication
Title color indication

—Continued on next Page—

MICROFILM

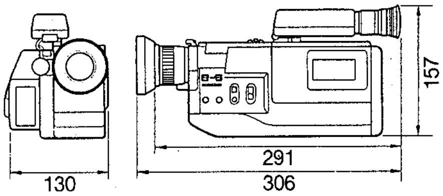
VIDEO

8 VIDEO CAMERA RECORDER

SONY®

General

Power requirements	Battery compartment 6 V/8.5 V
Power consumption	7.1 W (camera recording) including the viewfinder
Installation	Vertically
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4°F to +140°F)
Dimensions	Approx. 130 × 157 × 291 mm (w/h/d) ($5\frac{1}{8} \times 6\frac{1}{4} \times 11\frac{1}{2}$ in.)
Weight	Approx. 1.5 kg (3 lb 5 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type
Supplied accessories	Lithium battery (1) Shoulder strap (1)



Optional accessories

Carrying case LCH-V50
Battery pack NP-4000, BP-400
DC pack DCP-80
Car battery cord DCC-16AW
External microphone ECM-Z200, ECM-K120
External microphone shoe SAD-100
Connecting cable VMC-710M/720M (2 phono to 2 phono), VMC-910MS/920MS (2 phono to 3 phono)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UN TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT SONT IDENTIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

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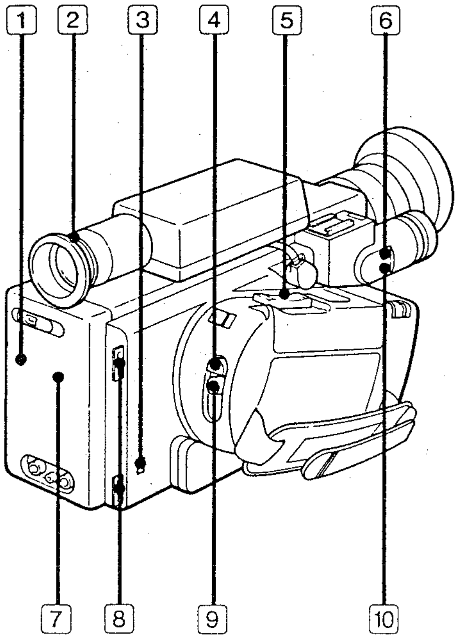
SECTION 1
GENERAL

1-1. LOCATION AND FUNCTION OF PARTS AND CONTROLS

A-1



For details on the use of each control, refer to the pages indicated in the circle.

A-1

1 **BATTERY/CAUTION lamp**
Blinks when the battery is exhausted, and lights up when the unit cannot record normally.

2 **Viewfinder lens adjustment ring ⑬**
Adjust to your eyesight to assure good focus. Be sure to adjust this knob when shooting for the first time.

3 **EDIT switch ㉘**
Normally set it to the upper position. When editing tapes, set to EDIT.

4 **STANDBY switch ⑬**
Slide up to set the unit to recording pause mode.

5 **Power zoom button ⑳**

6 **MIC (external microphone) jack**

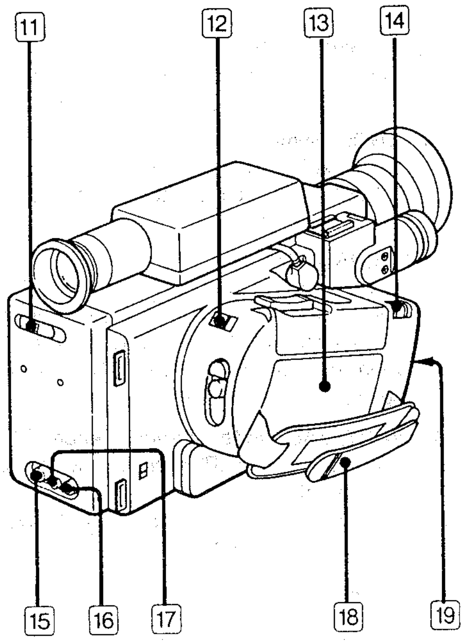
7 **DEW lamp ㉙**
Lights up when moisture has condensed inside the unit.

8 **Hooks for shoulder strap**
Attach a shoulder strap.

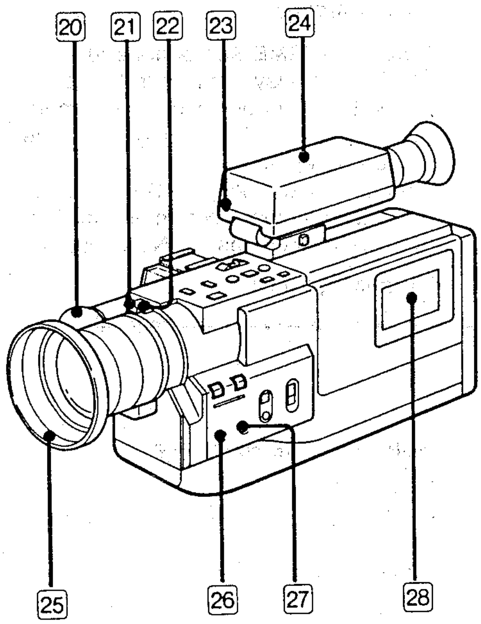
9 **START/STOP button ⑭**
Press to start and stop camera recording.

10 **DC OUT (DC output) jack**

A-2



A-3



A-2

11 **Cassette eject button** ⑫

12 **GRIP RELEASE switch** ⑨ ⑩

13 **Grip**

14 **BATT EJECT (battery eject) switch**

15 **VIDEO OUT (video output) jack** (phono jack)

16 **AUDIO OUT (audio output) jack** (phono jack)

17 **RFU DC OUT (RFU adaptor DC output) jack**
(special minijack)
Supplies power to the RFU-88UC RFU adaptor.

18 **Grip strap** ⑨ ⑩

19 **Battery compartment**

A-3

20 **Built-in microphone** (monaural)

21 **Zoom lever** ⑳

22 **Macro set button** ㉑

23 **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

24 **Viewfinder** ⑨ ⑮
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

On the bottom of the viewfinder
☼ : **Brightness control screw**
⊜ : **Focus control screw**
Normally, there is no need to adjust these screws. Adjust only when the picture is not displayed clearly.

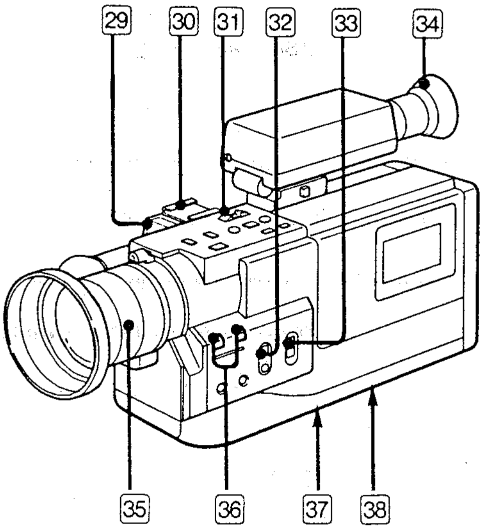
25 **Lens hood**

26 **BACK LIGHT button** ⑲

27 **REC REVIEW (recording review) button** ⑭

28 **Cassette holder**

A-4



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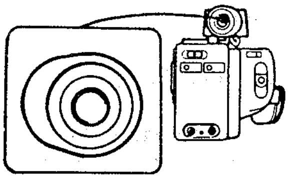

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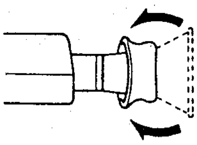
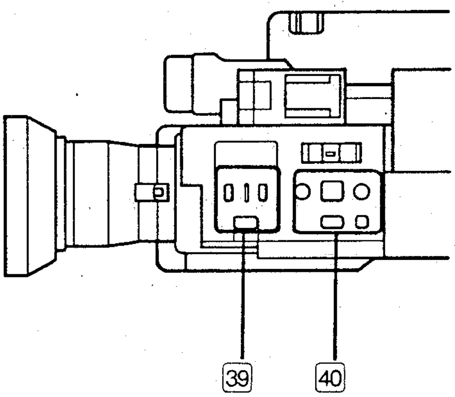


A-7



A-4

29 **White balance sensor**
This is the sensor for auto white balance adjustment.

30 **Accessory shoe**
Attach an optional external microphone or video light here.

31 **POWER switch**
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

32 **FOCUS switch**
Normally set to AUTO for auto focusing. To focus manually, set to MAN (manual). To activate the auto focusing function briefly when the switch is set to MAN, hold down the PUSH AUTO button.

33 **WHITE BAL (white balance) switch**
Normally set to AUTO for auto white balance adjustment.
Set it to ☀ (outdoors), or ☼ (indoors) for manual adjustment.

34 **Eyecup**
The eyecup is attached for the right eye. For the left eye, detach the rubber eyecup and attach it as illustrated. A-5
To view while wearing glasses, fold out the eyecup as illustrated. A-6

35 **Focus ring ⑰**

36 **DATE and TIME SET buttons ㉒**
Press to display or turn off the date or time. Keep these buttons depressed simultaneously for more than 3 seconds to enter date and time setting mode.
In the setting mode, the DATE SET button functions as the + button and the TIME SET button functions as the NEXT button.

37 **Tripod receptacle**

38 **Lithium battery compartment ⑪**

A-7

39 **SUPERIMPOSE buttons ㉕**
MEM (memory) button
COLOR button
ON/OFF button

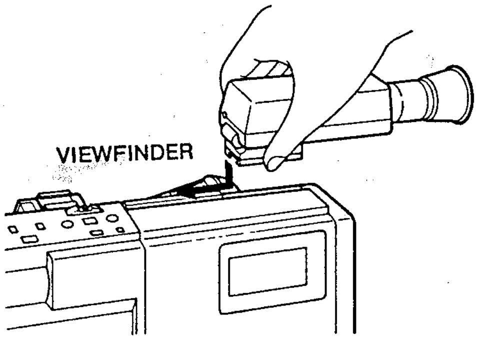
40 **Tape transport buttons ㉗**
◀ (playback)
◀◀ FF (fast forward)
▶▶ REW (rewind)
■ (stop)
❚❚ (pause)

1-2. HOW TO ATTACH THE VIEWFINDER

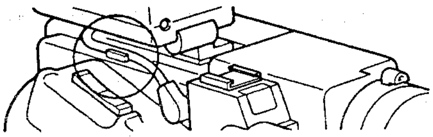
1. Slide the viewfinder onto the viewfinder shoe, while pressing the lock/release button on the side of the viewfinder. B-1
2. Slide the viewfinder all the way forward and release the lock/release button.
3. Move the viewfinder back and forth until it locks.
4. Plug the connecting cord into the VIEWFINDER jack and fix the cord. B-2

For the easiest shooting
The viewfinder can be locked in 3 positions. Select the most comfortable position while pressing the lock/release button. B-3
When shooting from a low angle, you can raise the viewfinder up to 90°. B-4

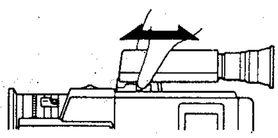
B-1



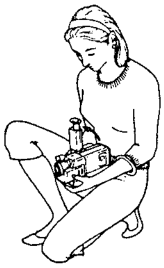
B-2



B-3



B-4



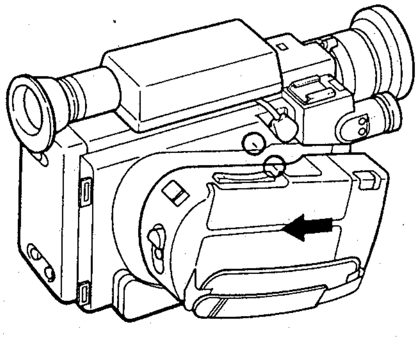
1-3. HOW TO ATTACH THE GRIP

To attach the grip C-1
1 Align the marks.
2 Pull the grip until it locks.

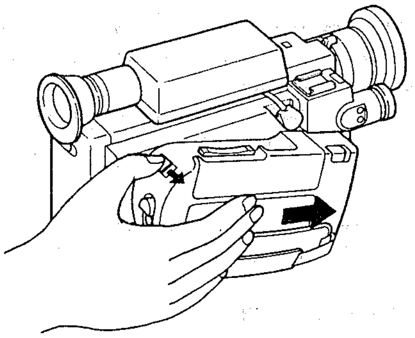
To detach the grip C-2
Slide the grip off while sliding the GRIP RELEASE switch on it.

To adjust the length of the grip strap C-3
Adjust the length so that your thumb can easily manipulate the START/STOP button.

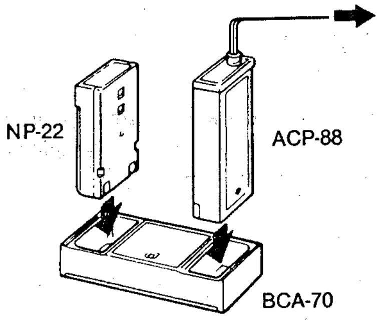
C-1



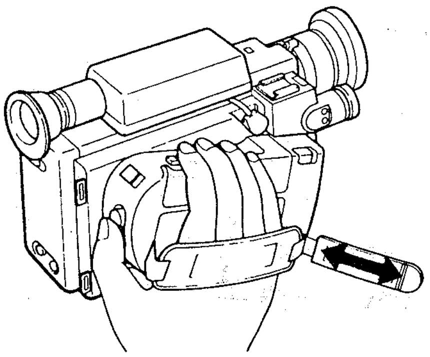
C-2



D-1



C-3



1-4. POWER SOURCES

SELECTION OF POWER SOURCES

Operate the unit on one of the following power sources.

Place	Power source	Accessory to be used
Outdoors	Battery pack	**NP-22 battery pack**
		NP-4000 battery pack and DCP-80 DC pack
Indoors	House current	**ACP-88 AC pack**
In cars	12 V or 24 V car battery	**DCP-80 DC pack and DCC-16AW car battery cord**

Note on power source
Do not disconnect the power source or remove the battery pack during recording or playback, because it may damage the inserted cassette tape. If disconnected accidentally, supply the power again immediately.

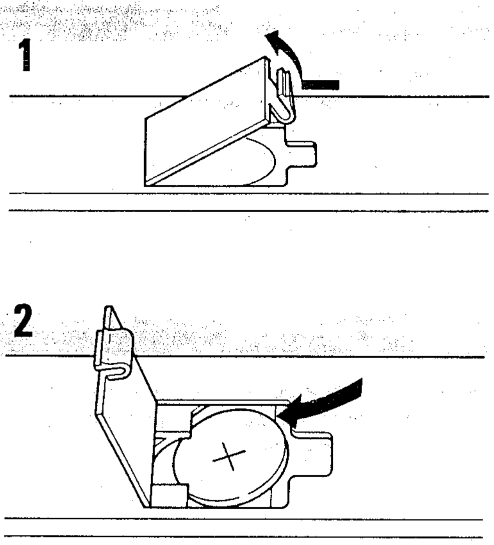
FOR OUTDOOR USE — battery pack

How to charge D-1
Use the ACP-88 AC pack and the BCA-70 battery charge adaptor.

The charging time is about 1.5 hours using the ACP-88.

1 Insert the NP-22 and the ACP-88 with the metal contacts facing inside.
2 Connect the AC power cord of the ACP-88 to a wall outlet.
The charging will stop automatically when the battery is fully charged, and the CHARGE lamp of the BCA-70 will go out.

G



LITHIUM BATTERY G

This unit uses a lithium battery to activate the clock and to keep a title in memory. Before operating the unit for the first time, install the supplied lithium battery:

1 Open the cover of the lithium battery compartment.
2 Install the supplied CR2025 lithium battery with the ⊕ side facing out.
3 Close the cover.

LITHIUM BATTERY LIFE

Approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 7 seconds. When the battery is completely exhausted, "AM12:00:00" will blink for about 7 seconds and then go off. If you press the DATE or TIME button after that, "JAN.1.1987" or "AM12:00:00" will blink. **In this case, replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

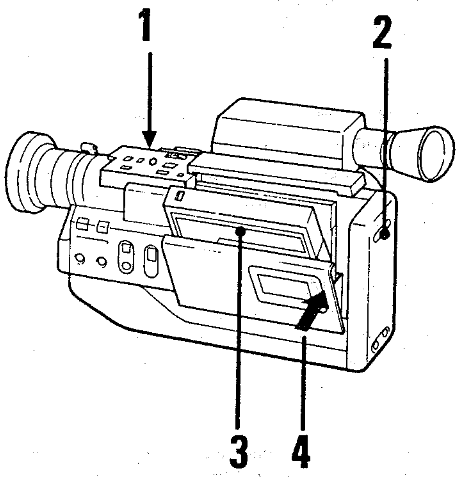
NOTES ON LITHIUM BATTERY

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

WARNING
Battery may explode if mistreated.
Do not recharge, disassembly or dispose of in fire.

1-5. CASSETTE CARE

H-1



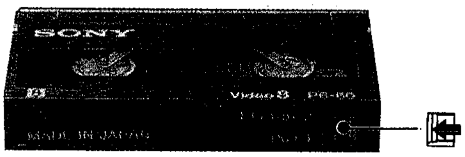
CASSETTE INSERTION H-1

1. Connect a power source.
2. Press and slide the cassette eject button.
   The cassette holder will open.
3. Insert a cassette with the window facing outside.
4. Close the cassette holder.

CASSETTE EJECTION

1. Make sure that a power source is connected.
2. Press and slide the cassette eject button.
3. Take out the cassette and close the cassette holder.

H-2



TO PREVENT ACCIDENTAL ERASURE H-2

Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To re-record on the cassette, slide the tab in to uncover the opening.

NOTES

- Don't press the upper lid of the cassette compartment forcibly when it is moving.
- When the cassette holder is pressed to close, the upper lid of the cassette compartment will automatically lower. Be careful not to trap your hand between the cassette holder and the lid. To open the cassette holder, press and slide the cassette eject button.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

1-6. PREPARATION FOR CAMERA RECORDING

[1] Connect a power source, and set the POWER switch to CAMERA. I-1

[2] Adjust the position of the viewfinder lens. I-2

The position of the viewfinder lens for optimum vision varies depending on the person.

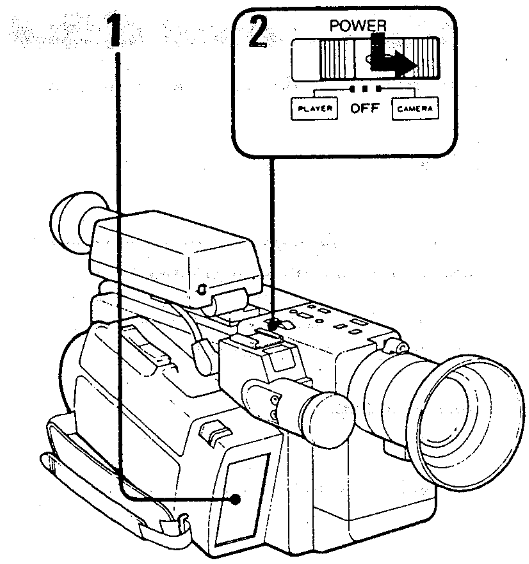
Remove the lens cap.

1 Slide the STANDBY switch up.
2 Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.

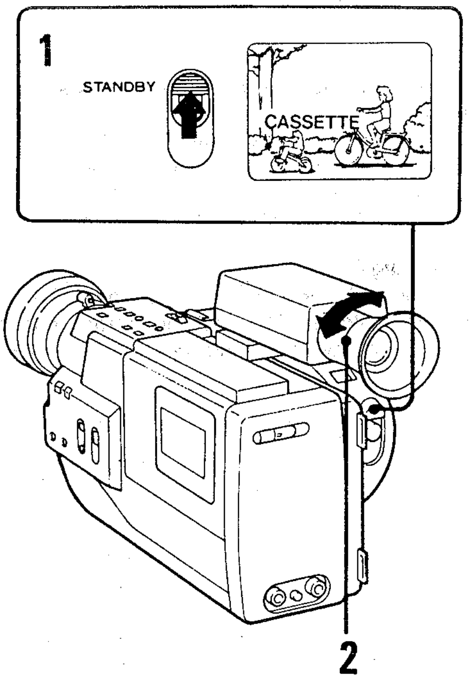
Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

NOTE
If you leave the unit in the recording pause mode for 7 minutes or more, the unit will be automatically turned off. To resume recording pause mode, slide the STANDBY switch down once and slide it up again.

I-1



I-2



1-7. EASY CAMERA RECORDING WITH AUTOMATIC ADJUSTMENT

HOW TO RECORD

Hold the camera recorder as in the illustration. J-1

[1] Set the POWER switch to CAMERA, and insert a cassette. J-2

[2] Set the following switches to the standard position for automatic adjustment. J-3
- FOCUS switch → AUTO (auto focusing)
- WHITE BAL switch → AUTO (linear auto white balance adjustment)

[3] Start recording. J-4
1. Slide the STANDBY switch up.
   The unit will enter the recording pause mode.
2. Press the START/STOP button.
   Recording will start.

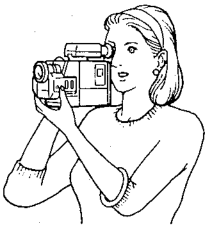
Check on the viewfinder screen
STBY: Displayed during recording pause mode.
REC: Displayed during recording.

To stop recording
Press the START/STOP button again.
The unit will enter the recording pause mode.

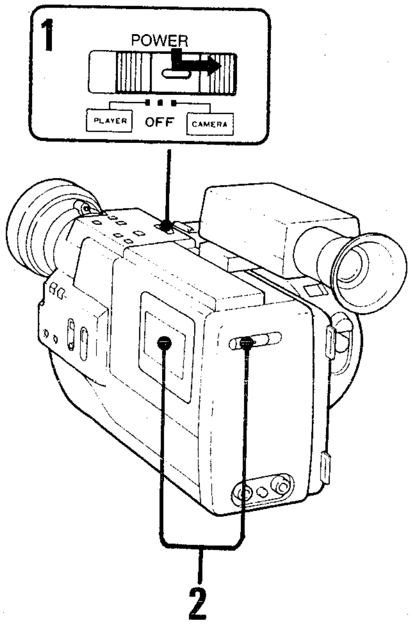
To check the last portion of the previous recording
Press the REC REVIEW button.
The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

After using
Slide the STANDBY switch down and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.)

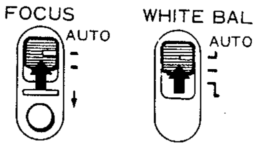
J-1



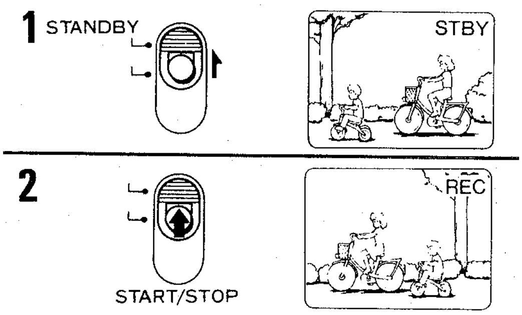
J-2



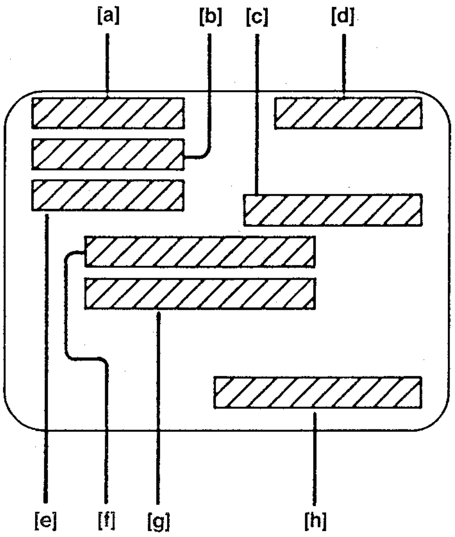
J-3



J-4



K



INDICATIONS INSIDE THE VIEWFINDER K

[a] **OUTDOOR**
The WHITE BAL switch is set to ☀.
INDOOR
The WHITE BAL switch is set to ☆.

[b] **BACK LIGHT**
The BACK LIGHT button has been pressed (see page 19).

[c] **Title color** (see page 25).

[d] **STBY**
Recording is momentarily stopped (recording pause mode).
REC
Recording is going on.

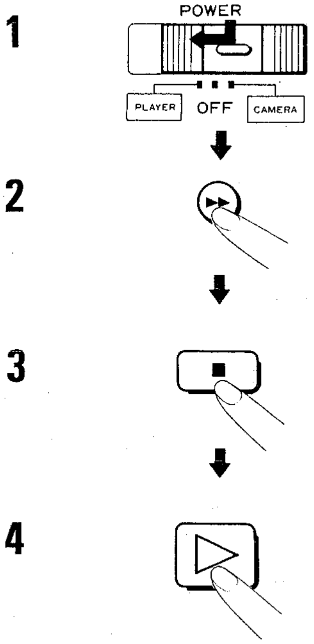
[e] **LOW LIGHT**
Insufficient light.

[f] **BATTERY**
Weak battery.
CAUTION
The unit cannot function normally.
DEW
Moisture condensation inside the unit (see page 29).

[g] **CASSETTE**
No cassette has been inserted or the safety tab of the inserted cassette is slid out.
TAPE END
The tape is at its end.

[h] **Date or time** (see page 22).

L

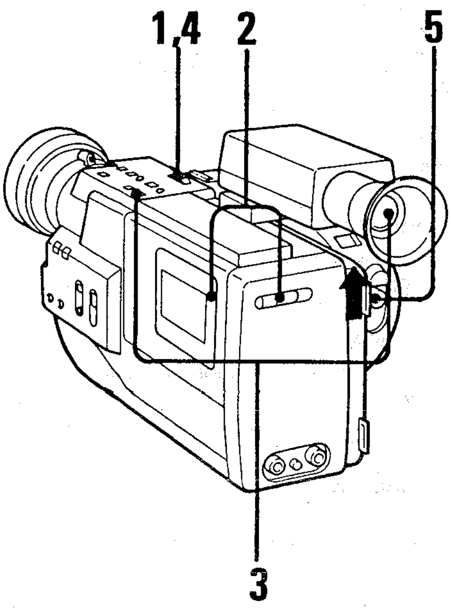


INSTANT PLAYBACK ON THE SPOT L

1. **Set the POWER switch to PLAYER.**
2. **Rewind the tape with the ▶▶ button.**
3. **Stop the tape with the ■ button.**
4. **Start playback with the ◁ button.**

The playback picture will appear on the viewfinder screen.

M



SMOOTH RECORDING M

A smooth transition between scenes can be made after the recording is stopped or the unit is turned off, provided that the cassette isn't removed.

To record smoothly after having removed the cassette, proceed as follows.

1 **Set the POWER switch to PLAYER.**
2 **Insert the cassette.**
3 **Looking at the playback picture on the viewfinder screen, press the ❚❚ button where you want to restart recording.**
4 **Set the POWER switch to CAMERA.**
5 **Slide the STANDBY switch up, and press the START/STOP button.**
Recording will start.

1-8. MANUAL FOCUSING

Use manual focusing when shooting subjects difficult to focus automatically (listed on page 18).

[1] **Make the subject as large as possible in the viewfinder.** N-1
Turn the zoom lever to the telephoto position.

[2] **Focus.** N-2
1 Set the FOCUS switch to MAN.
2 Turn the focus ring to bring the object into focus.

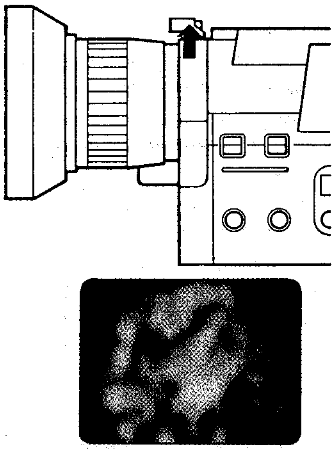
[3] **Set the desired shot length by turning the zoom lever.** N-3

To activate auto focusing quickly from the manual focusing mode N-4
Press the PUSH AUTO button. Auto focusing will function as long as it is kept pressed.

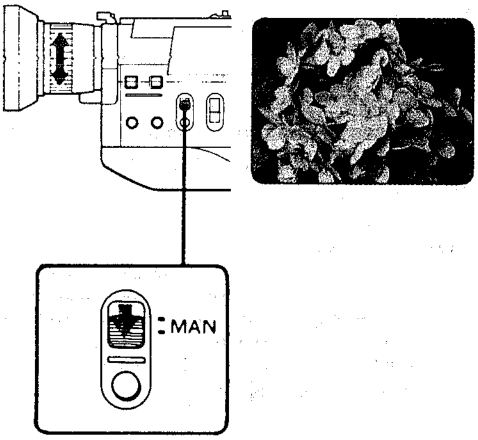
SOME HELPFUL HINTS

- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the ϕ mark on the side of the recorder body.

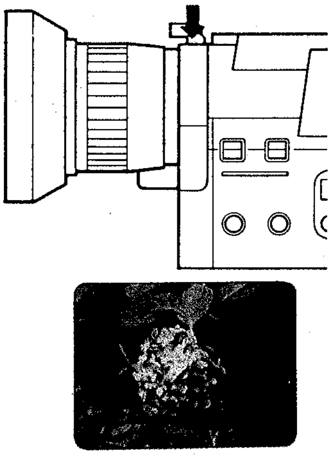
N-1



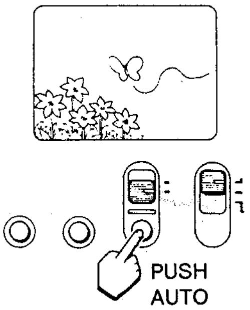
N-2



N-3

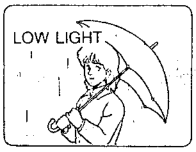


N-4

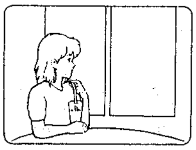


N-5

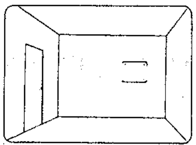
[a]



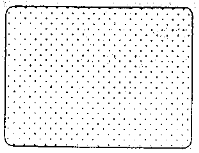
[b]



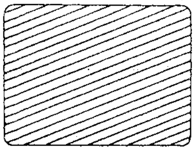
[c]



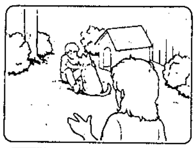
[d]



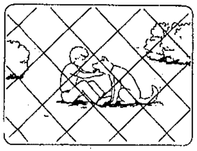
[e]



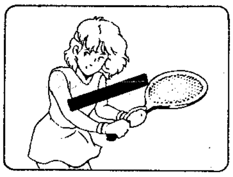
[f]



[g]



N-6



POOR CONDITIONS FOR AUTO FOCUSING N-5

[a] Insufficient light
[b] Too much bright light behind the subject
[c] Subjects with flat colors and less contrast—wall, sky, etc.
[d] Finely detailed repetitive patterns
[e] Slant stripes
[f] When the distance between subjects at the center is extreme (e.g. one subject is close, the other is away)
[g] Subjects beyond screens, nets, etc. or when another subject passes across the camera

OTHER USES OF MANUAL FOCUSING

- When using special effects lenses or filters
- When shooting still subjects on a tripod
- To save battery wear
  (When the FOCUS switch is set to AUTO, the auto focusing operates to move the focus ring automatically even in recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting, see page 21.

TCL AUTO FOCUSING SYSTEM

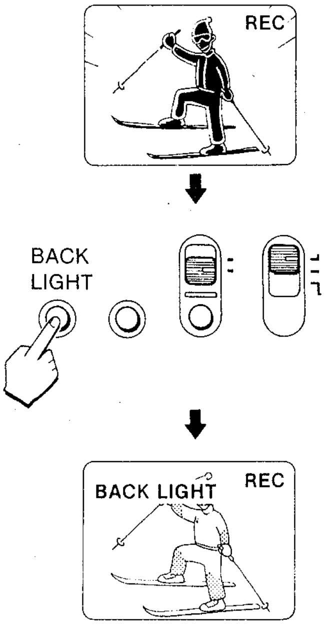
The TCL (Through Camera Lens) auto focusing system incorporated in this unit utilizes high-precision sensors to determine picture contrast at the center of the viewfinder screen (the portion marked with the blue bar in the illustration) and adjust focus accordingly for automatic, highly accurate focusing. N-6

NOTE

It may take several seconds to get focus when the camera is rapidly panned from a near subject to a distant subject with less contrast.

1-9. BACK LIGHT ADJUSTMENT

P



This unit adjusts the iris automatically. However, when shooting a subject that is backlit, press the BACK LIGHT button.

(The BACK LIGHT Indication appears when the BACK LIGHT button has been pressed.)

After shooting that particular scene, press the BACK LIGHT button again to release it.

(The BACK LIGHT indication goes out.)

NOTE

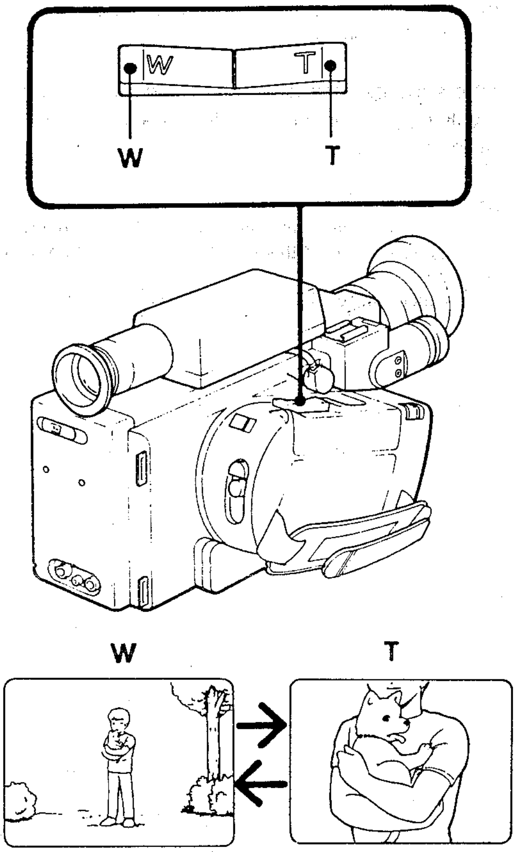
Be sure to release the back light adjustment function when it becomes unnecessary. Otherwise the recorded picture will be too bright.

(The function will be released once the POWER switch is set to OFF.)

1-10. ZOOMING

The size of the subject in the scene can be changed.

Q-1

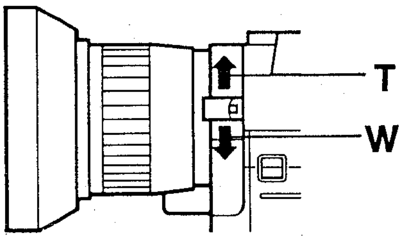


POWER ZOOM Q-1

— for smooth and constant zooming

Press the T side of the power zoom button for telephoto and the W side for wide-angle.
The zoom ring will move automatically.

Q-2



MANUAL ZOOM Q-2

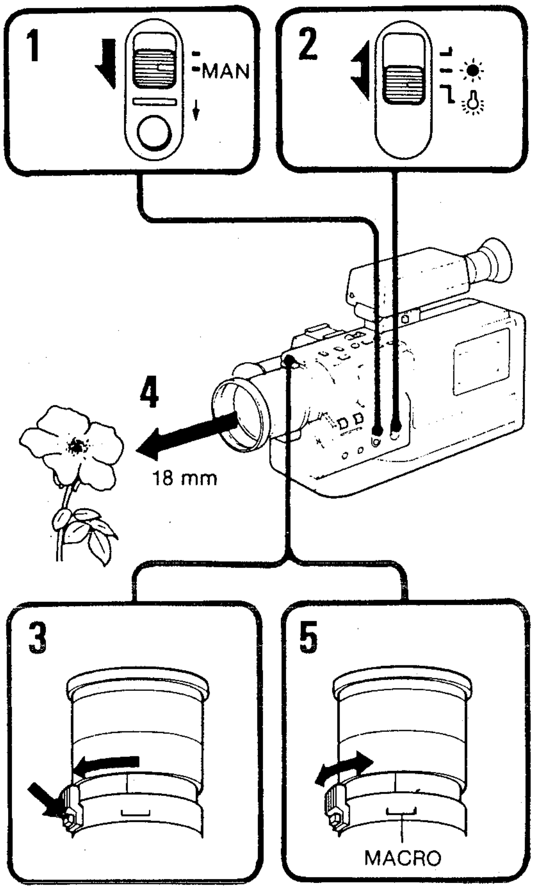
— to create a dramatic effect

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

For more zooming effect
Use an optional conversion lens (VCL-1546A or VCL-0746A).
Auto focus, however, will not function in that case.

1-11. CLOSE-UPS(MACRO)

R



Even tiny objects can literally fill the screen for dramatic close-up effects.
(Remove the lens hood before operation.)

1 Set the FOCUS switch to MAN.
2 Set the WHITE BAL switch to ☀ or 💡 .
3 Turn the zoom lever to the left for MACRO position, holding down the green macro set button.
4 Bring the recorder as close as necessary to obtain the desired subject size.
The subject can be as close as approximately 18 mm (¾ in.) from the lens surface.
5 Turn the zoom lever within the MACRO range to focus sharply.

NOTES

- Auto focusing and linear auto white balance adjustment do not function properly in macro shooting.
- If the subject is closer than 18 mm, it cannot be brought into focus.
- When shooting in macro, the depth of field is very shallow, so pay attention to focus. To keep the subject in focus, use a tripod or monopod.
- Zooming is not possible during macro recording. To change the size of the subject, move the camera recorder closer or further away.

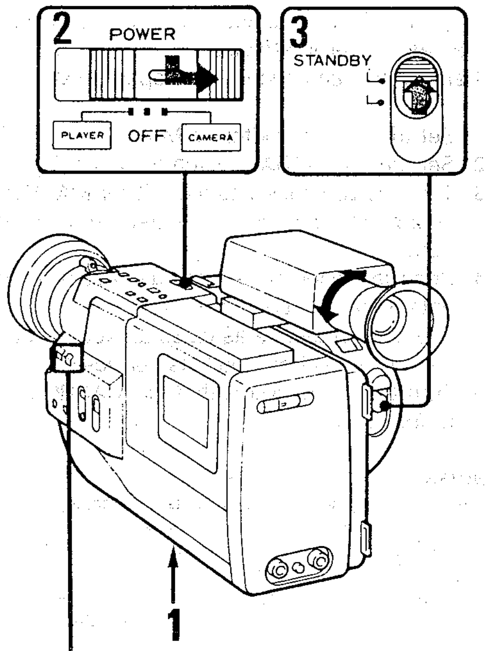
1-12. RECORDING DATE OR TIME

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time S-1

1 Make sure that the lithium battery is installed. See page 11..
2 Set the POWER switch to CAMERA.
3 Slide up the STANDBY switch to set the unit in the recording pause mode.

S-1

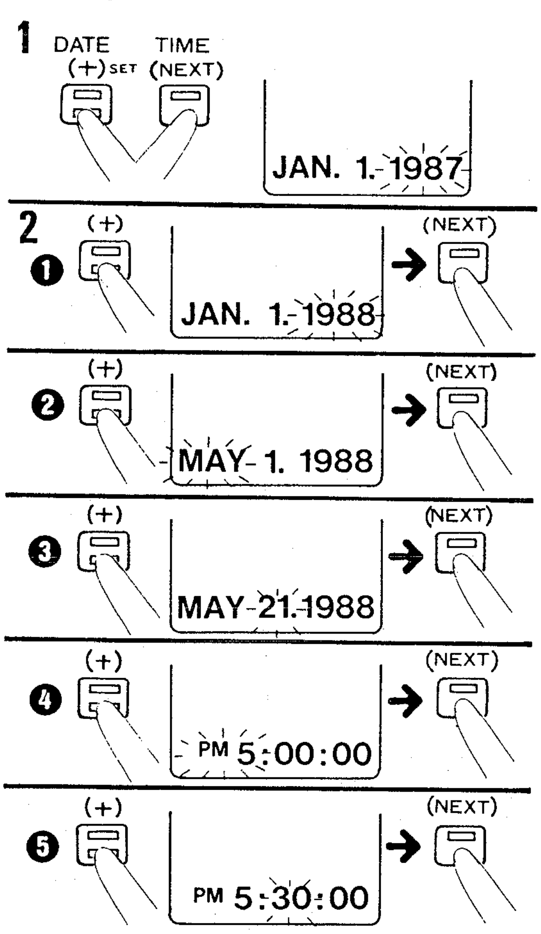


TO SET DATE AND TIME S-2

1 Press the DATE and TIME SET buttons simultaneously **for more than 3 seconds.** The date indication will appear on the viewfinder screen (date/time setting mode). The DATE button now functions as the + button and the TIME button functions as the NEXT button.
2 Adjust the year, month, day, hour and minute in sequence, following the illustration. First adjust the blinking digits with the + button, and then press the NEXT button. ❶ Year ❷ Month ❸ Day ❹ Hour ❺ Minute After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

S-2



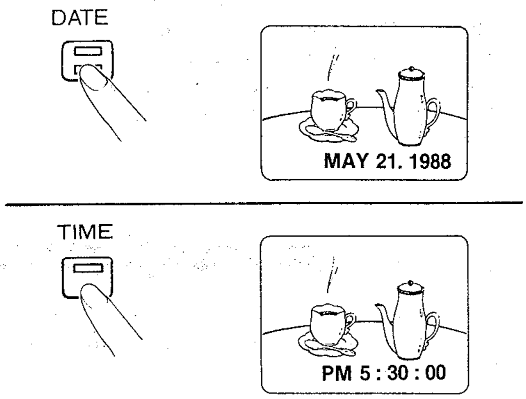
To clear the time indication from the display
Press the TIME SET (NEXT) button again.

THE + BUTTON CAN BE PRESSED IN TWO WAYS

- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

NOTE
The year indication will return to "1987" when it exceeds "2015".

S-3



To check the preset date and time
Press the DATE or TIME SET button. When the same button is pressed again, the indication goes off.

To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an anounced time signal.

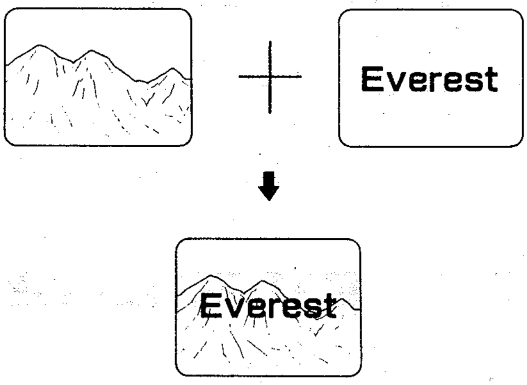
TO RECORD THE DATE OR TIME S-3

During camera recording or in recording pause mode, press the DATE or TIME SET button to display the date or time on the viewfinder screen.
If the unit is set to recording mode, the date or time being displayed will be recorded together with the picture.

To stop recording the date or time, press the DATE or TIME SET button again. The picture recording will continue.

1-13. RECORDING A TITLE

$\boxed{T}$



A title or a figure can be memorized and recorded together with the picture.
The memorized title with a selected color (8 colors available) is superimposed onto the picture being recorded. $\boxed{T}$

PREPARATIONS

The recommended position of the title card is about 212 (8⅜ inches) mm apart from the ϕ mark on the camera.

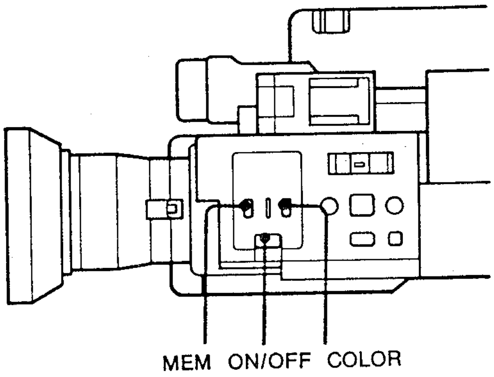
To make a desired title card
Use a white and plane card and draw the title on it with a deep color (black is recommended for the best result) in thick letters.

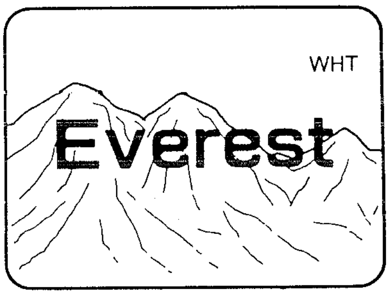
Before memorizing the title

1. Make sure that the lithium battery is installed. See page 11.
2. Set the POWER switch to CAMERA.
3. Slide up the STANDBY switch to set the unit in the recording pause mode.

Note
The title in the peripheral area of the screen cannot be memorized. Especially, when a white title with the black background covering the entire screen is memorized, a white frame may appear.
When deciding the title size, check the effective picture size on your video monitor.

U





TO MEMORIZE THE TITLE U

1 Set the zoom lever to the MACRO position. Point the camera to the title card and adjust the focus.
2 Press the MEM button to memorize the title.
3 Select the title color while observing the color indication in the viewfinder. Each push on the COLOR button cyclically changes the color, as follows:

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black)←YEL (yellow)←VIO (violet)←RED

4 Press the SUPERIMPOSE ON/OFF button to turn off the title.

NOTES
- The color indication in the viewfinder is not recorded on the tapes.
- You can change the title color even after starting the recording.
- To memorize a title, use of an appropriate light is recommended for a better result.

To check the title
To check the memorized title, press the SUPERIMPOSE ON/OFF button. To turn off the title, press the button again.

TO RECORD THE TITLE

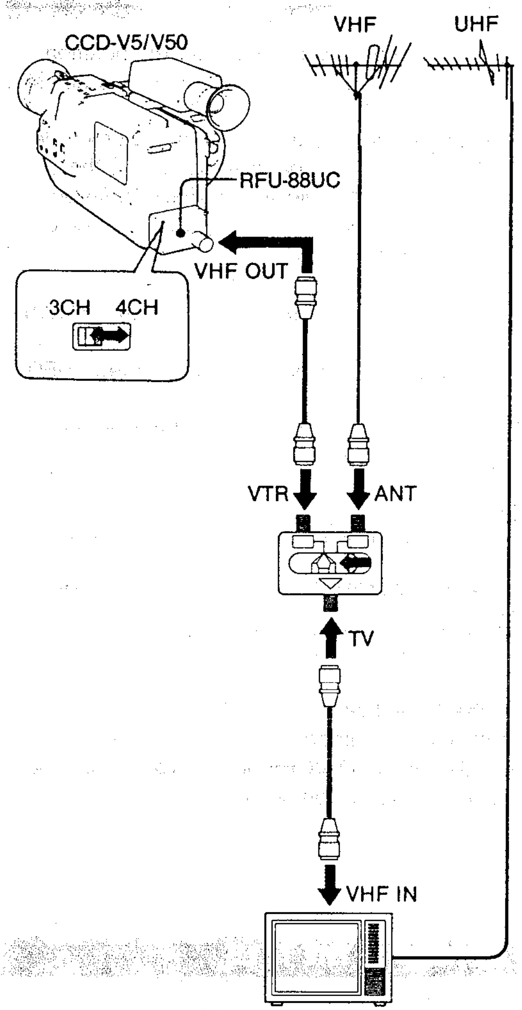
During camera recording, press the SUPERIMPOSE ON/OFF button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

To record the title from the beginning
Before starting the recording, press the SUPERIMPOSE ON/OFF button.

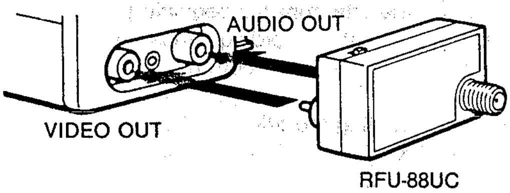
To stop recording the title, press the SUPERIMPOSE ON/OFF button again. The picture recording will continue.

For recording the title several times
By repeating the above procedure, you can record the title as many times as desired.

W-1


CCD-V5/V50
VHF
UHF
RFU-88UC
VHF OUT
3CH 4CH
VTR
ANT
TV
VHF IN

W-2


AUDIO OUT
VIDEO OUT
RFU-88UC

1-14. PREPARATION FOR PLAYBACK

—Connecting a TV set—

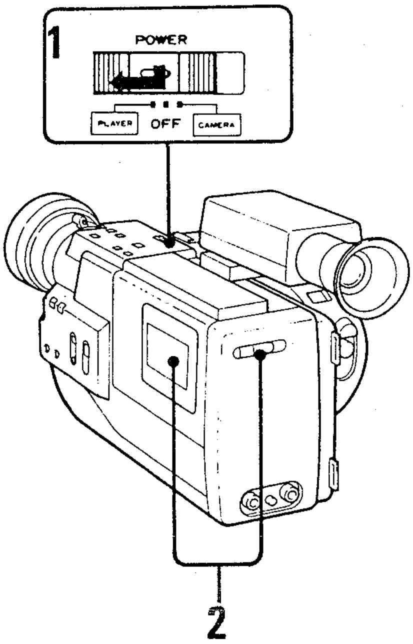
[1] Connecting a TV without audio/video input jacks W-1

Connect the RFU-88UC RFU adaptor to the CCD-V5/V50. W-2

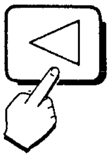
1. Connect the antenna, RFU-88UC, and TV to the antenna selector (supplied with the RFU-88UC) using the 75-ohm coaxial cables.
2. Set the RF unit selector to 3CH or 4CH, whichever channel is not active in your area.
3. Set the selector switch on the antenna selector to VTR for viewing a playback picture.
4. Select the same channel on the TV as that selected on the RFU-88UC.

1-15. PLAYBACK

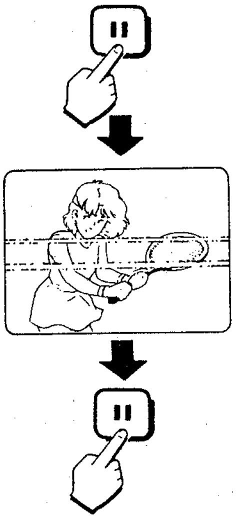
X-1



X-2



X-3



Turn on the TV (or Component TV), and select the channel for viewing a playback picture (or set the TV/VIDEO selector to VIDEO).

1 Set the POWER switch to PLAYER, and insert a cassette. X-1
2 Press the ◁ button. X-2
Playback will start.

To stop the tape, press the ■ button.

After using, be sure to set the POWER switch of the recorder to OFF.

To get a still picture X-3
Press the ❚❚ button during playback. To resume playback, press the ❚❚ button again or press the ◁ button.

MONITORING A HIGH-SPEED PICTURE

— To skip over or repeat a certain portion

1 In the playback mode, press the ◀◀ or ▶▶ button.
The picture will be monitored at high speed as long as it is kept pressed.
2 Release the ◀◀ or ▶▶ button at the desired point.
Normal playback will resume.

MONITORING A HIGH-SPEED PICTURE IN FAST-FORWARD OR REWIND MODE

Press the ◀◀ button in fast-forward mode or press the ▶▶ button in rewind mode. The picture is displayed while the button is kept pressed. Press the ◁ button to play back.

NOTES
- If you move the position of the POWER switch during playback, the tape will stop. When you move the POWER switch to CAMERA in the playback pause mode, however, the unit will enter recording pause mode.
- When the pause mode lasts for 7 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the still picture and the high-speed picture.
- The playback picture quality of a tape recorded in LP mode is not as good as that of an SP-recorded tape.

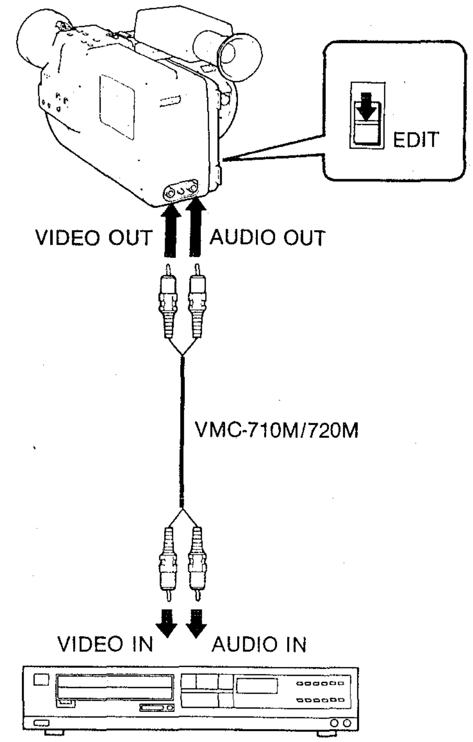
1-16. TAPE EDITING

CONNECTION WITH ANOTHER VCR Y

To edit a home movie tape, another VCR with AUDIO/VIDEO IN jacks is required.

Use the connecting cord VMC-710M/720M for connection. (If the AUDIO IN jack of the other video recorder is stereo, use the VMC-910MS/920MS instead.)

Y



HOW TO EDIT

CAUTION
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized duplication of such material may be contrary to the provisions of the copyright laws.

1. Set the POWER switch of the CCD-V5/V50 to PLAYER, and turn on the other VCR.
2. Insert a recorded cassette into the CCD-V5/V50, and a blank cassette to the other VCR.
   Be sure that the blank tape is rewound to the beginning.
3. Slide down the EDIT switch of CCD-V5/V50.
4. Set the input selector of the VCR to LINE.
5. Press the **II** button of the CCD-V5/V50 during playback at the point where you want to start recording.
6. Press the record button of the other VCR, pressing the **II** button.
7. Release the **II** buttons of both units.
   Recording will start.

After editing, turn off both units and be sure to slide the EDIT switch to the upper position.

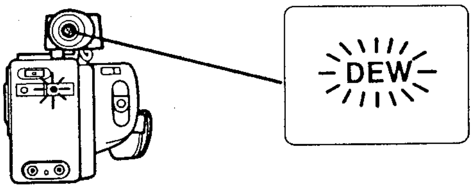
To cut off an unnecessary portion
Press the **II** button of the other VCR at the beginning of the unnecessary portion.
Release it where you want to resume recording.

Function of the EDIT switch
Slide this switch down whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the upper position.

1-17. NOTES ON MOISTURE CONDENSATION

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Z



Moisture is present inside the unit when: Z
- The DEW lamp lights up outside the recorder.
- The DEW indicator blinks inside the viewfinder.

No function except for cassette ejection will work.

⬇

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open (at least for one hour).

⬇

The unit can be used again if the upper lid of the cassette compartment shuts automatically when you push the PUSH mark on the front lid.

If moisture condensation occurs on the tape surface
There are no caution indicators, but no function except for cassette ejection will work.

⬇

Eject the cassette and let it dry thoroughly before resuming use.

If moisture condensation occurs on the lens
there are no caution indicators, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

NOTE
Do not push the upper lid of the cassette compartment forcibly when it doesn't shut automatically. Let the unit dry out a bit longer.

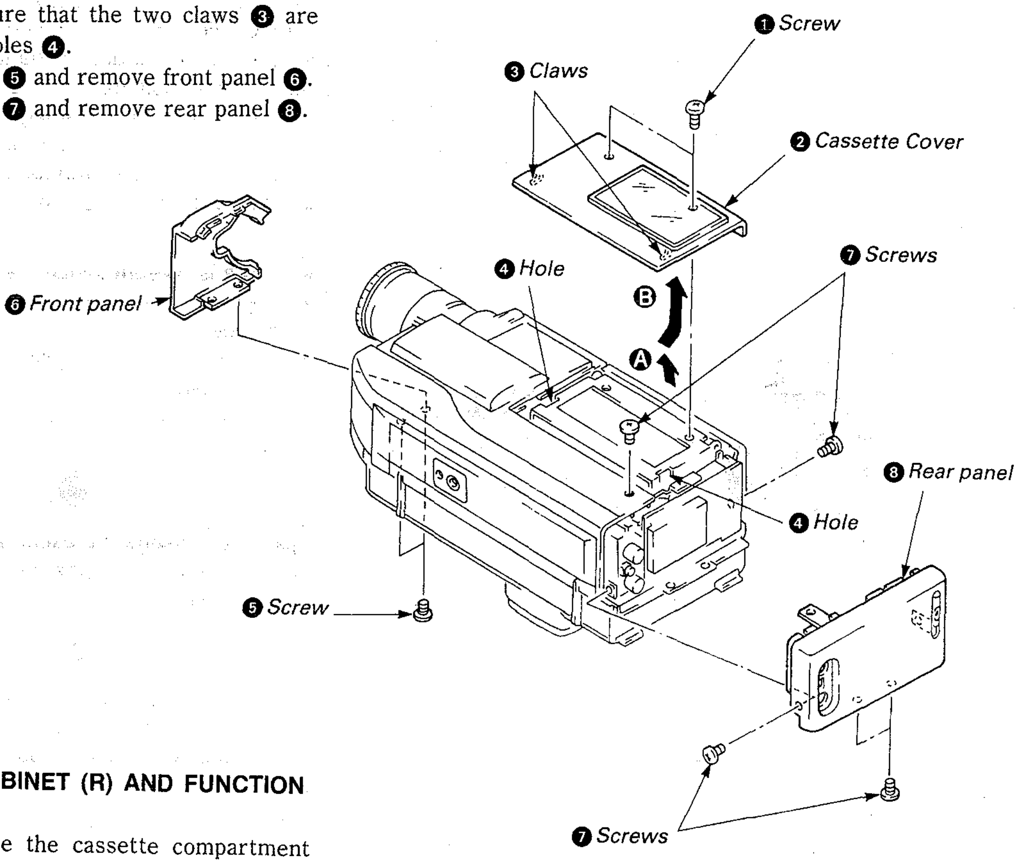
SECTION 2
DISASSEMBLY

2-1. REMOVAL OF THE FRONT AND REAR PANELS OF THE CASSETTE COMPARTMENT

1) Remove the two screws ❶.
2) Lift cassette cover ❷ in the direction of arrow Ⓐ and remove in the direction of arrow Ⓑ.

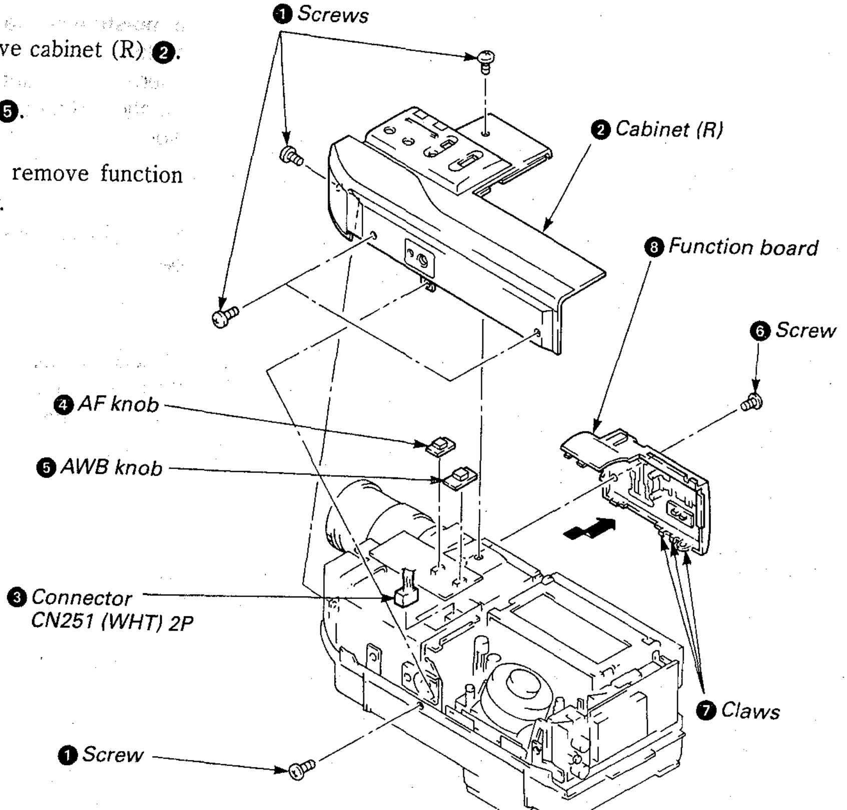
Note: When mounting, ensure that the two claws ❸ are inserted in the two holes ❹.

3) Remove the two screws ❺ and remove front panel ❻.
4) Remove the five screws ❼ and remove rear panel ❽.


❶ Screw
❸ Claws
❷ Cassette Cover
❹ Hole
❼ Screws
❻ Front panel
Ⓑ
Ⓐ
❽ Rear panel
❹ Hole
❺ Screw
❼ Screws

2-2. REMOVAL OF THE CABINET (R) AND FUNCTION BOARD

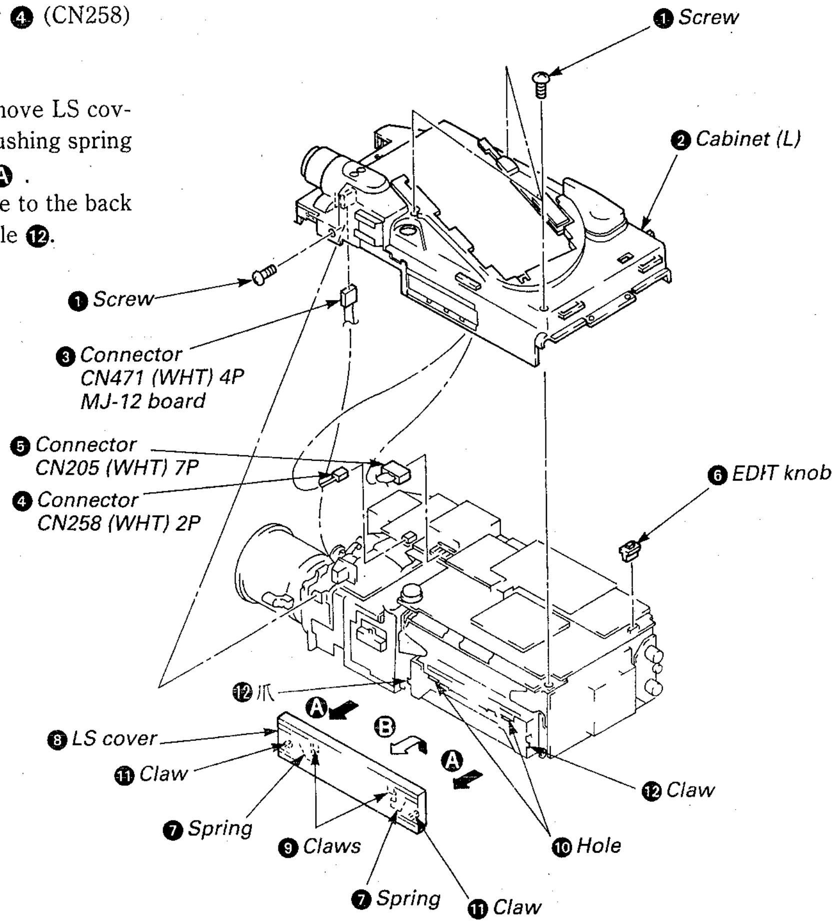
1) Refer to 2-1 and remove the cassette compartment cover, front panel and rear panel.
2) Remove the five screws ❶ and remove cabinet (R) ❷.
3) Remove connector ❸ (CN251).
4) Remove AF knob ❹ and AWB knob ❺.
5) Remove screw ❻.
6) Remove claw ❼ in three places and remove function board ❽ in the direction of the arrow.


❶ Screws
❷ Cabinet (R)
❽ Function board
❻ Screw
❹ AF knob
❺ AWB knob
❸ Connector
CN251 (WHT) 2P
❼ Claws
❶ Screw

2-3. REMOVAL OF THE CABINET (L) AND LS COVER

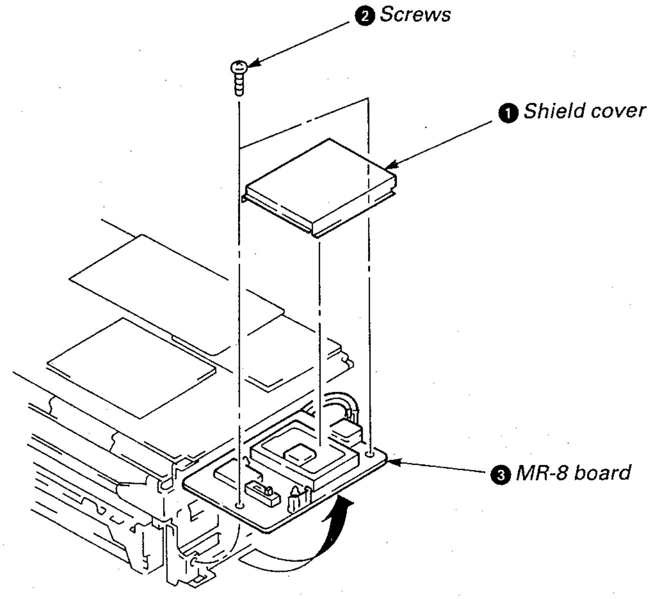
1) Remove cabinet (R) and the function board according to 2-2.
2) Remove four screws ❶ and cabinet (L) ❷.
3) Remove connector ❸ (CN471), connector ❹ (CN258) and connector ❺ (CN205).
4) Remove EDIT knob ❻.
5) Insert a slim standard screwdriver and remove LS cover ❽ in the direction of arrow Ⓑ while pushing spring ❼ (two places) in the direction of arrow Ⓐ .

Note: When mounting, set so claw ❾ will come to the back of hole ❿ and claw ⓫ to the back of hole ⓬.


❶ Screw
❷ Cabinet (L)
❶ Screw
❸ Connector
CN471 (WHT) 4P
MJ-12 board
❺ Connector
CN205 (WHT) 7P
❹ Connector
CN258 (WHT) 2P
❻ EDIT knob
⓬爪
Ⓐ
Ⓑ
Ⓐ
❽ LS cover
⓫ Claw
❼ Spring
❾ Claws
❼ Spring
⓫ Claw
⓬ Claw
❿ Hole

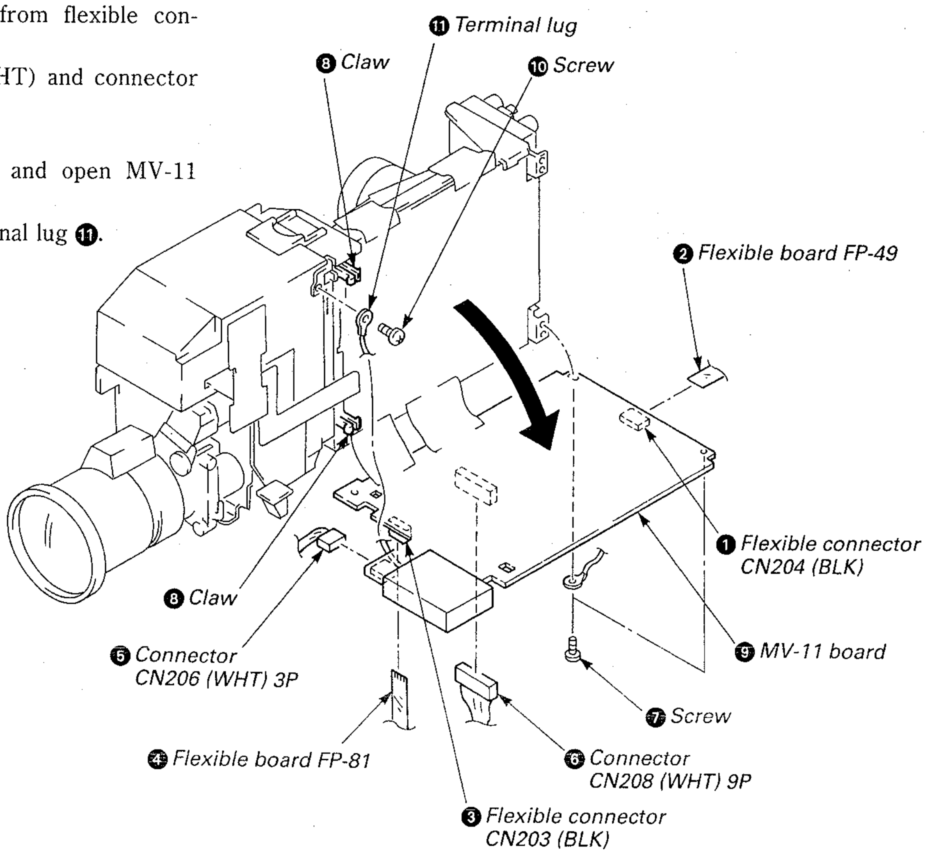
2-4. OPENING THE MR-8 BOARD

1) Remove shield cover ❶.
2) Remove screw ❷ (two places) and remove MR-8 board ❸ in the direction of the arrow.


❷ Screws
❶ Shield cover
❸ MR-8 board

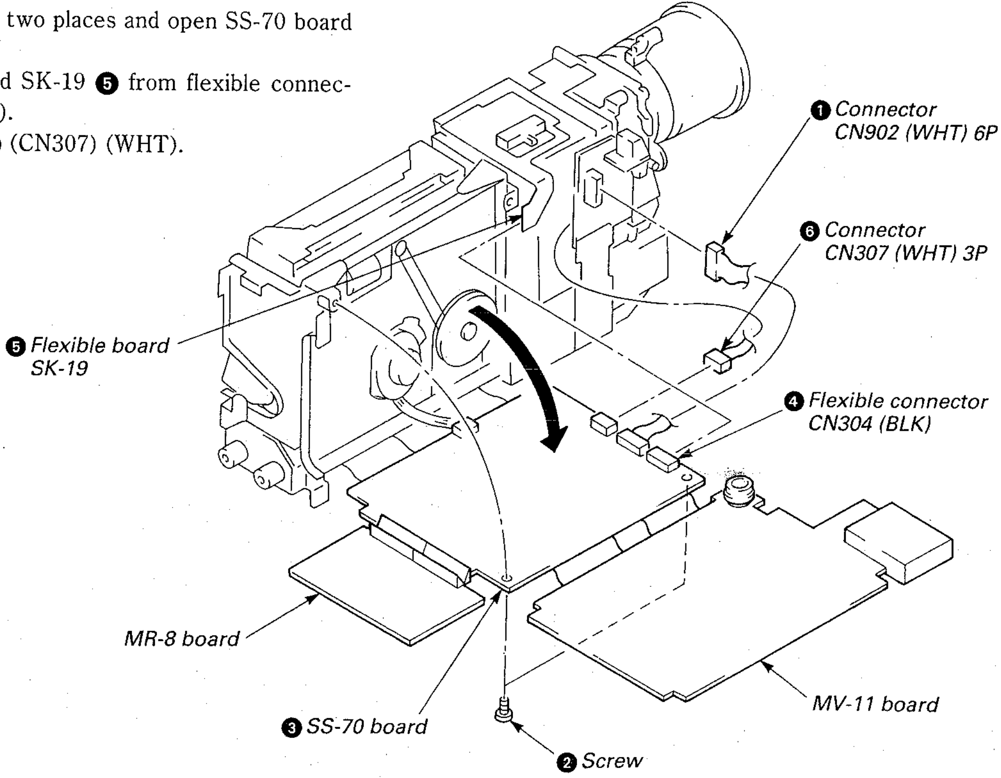
2-5. OPENING THE MV-11 BOARD

1) Remove flexible board FP-49 ❷ from flexible connector ❶ (CN204) (BLK).
2) Remove flexible board FP-81 ❹ from flexible connector ❸ (CN203) (BLK).
3) Remove connector ❺ (CN206) (WHT) and connector ❻ (CN208) (WHT).
4) Remove two screws ❼.
5) Remove claw ❽ from two places and open MV-11 board ❾.
6) Remove screw ❿ and remove terminal lug ⓫.


⓫ Terminal lug
❽ Claw
❿ Screw
❷ Flexible board FP-49
❶ Flexible connector CN204 (BLK)
❽ Claw
❾ MV-11 board
❺ Connector CN206 (WHT) 3P
❼ Screw
❹ Flexible board FP-81
❻ Connector CN208 (WHT) 9P
❸ Flexible connector CN203 (BLK)

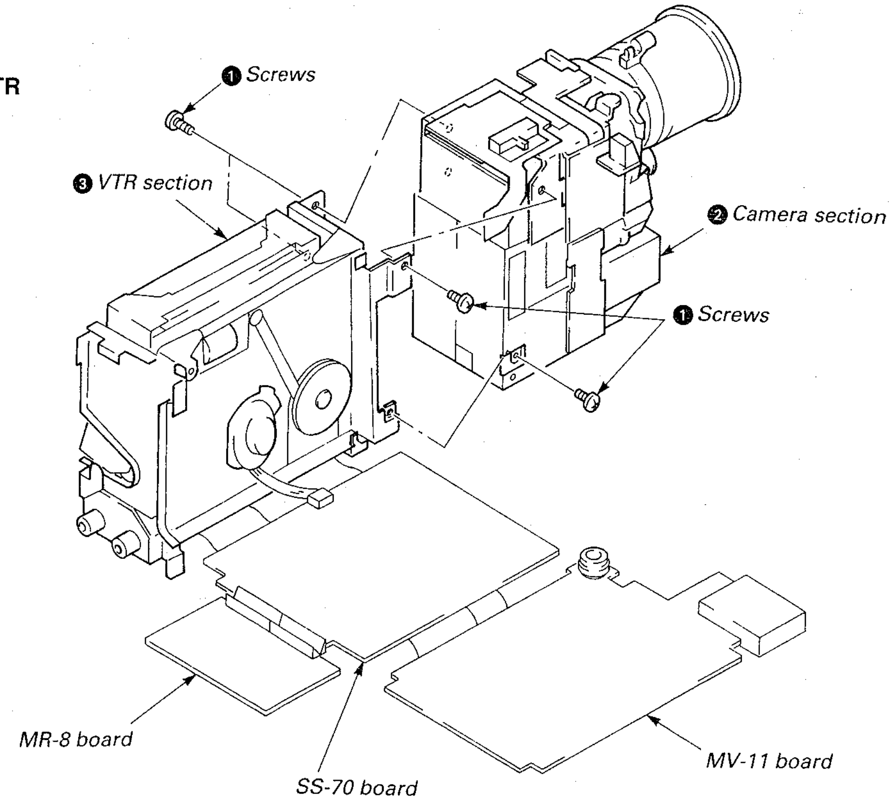
2-6. OPENING THE SS-70 BOARD

1) Open MR-8 board according to 2-4.
2) Open MV-11 board according to 2-5.
3) Remove connector ❶ (CN902) (WHT).
4) Remove screws ❷ in two places and open SS-70 board ❸.
5) Remove flexible board SK-19 ❺ from flexible connector ❹ (CN304) (BLK).
6) Remove connector ❻ (CN307) (WHT).


❶ Connector CN902 (WHT) 6P
❻ Connector CN307 (WHT) 3P
❺ Flexible board SK-19
❹ Flexible connector CN304 (BLK)
MR-8 board
MV-11 board
❸ SS-70 board
❷ Screw

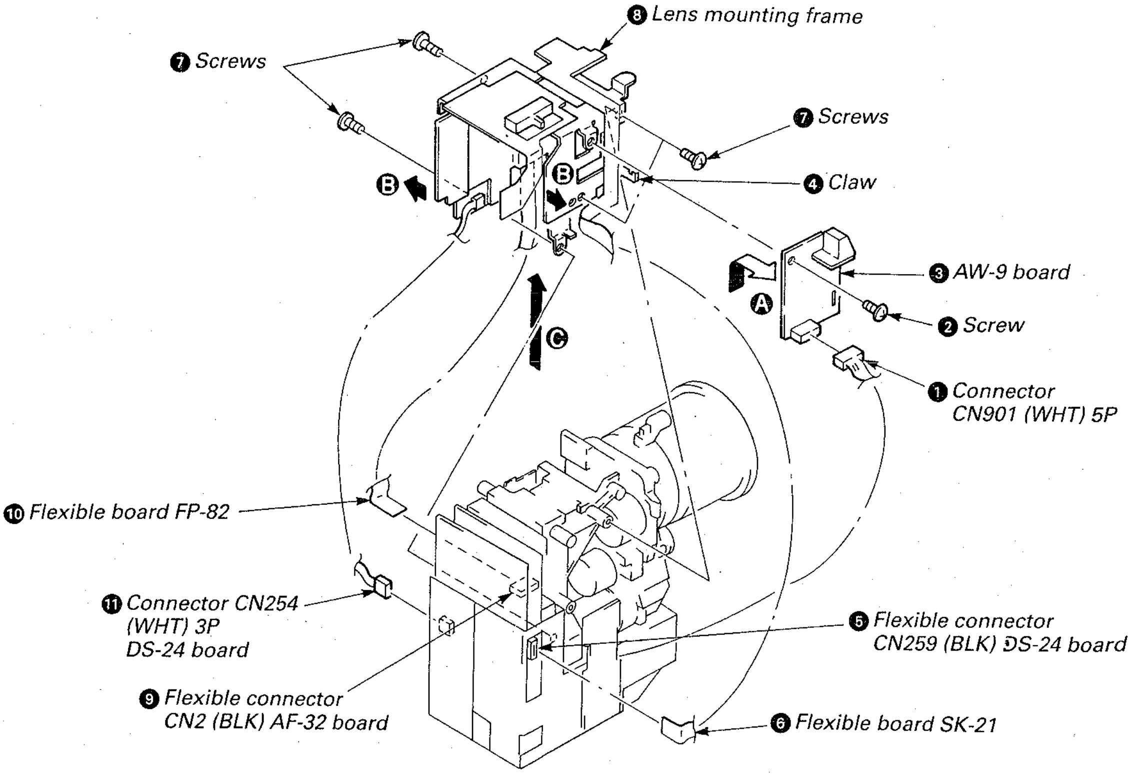
2-7. SEPARATING THE CAMERA AND VTR SECTIONS

1) Open the SS-70 board according to 2-6.
2) Remove the four screws ❶.
3) Separate the camera section ❷ and the VTR section ❸.


❶ Screws
❸ VTR section
❷ Camera section
❶ Screws
MR-8 board
SS-70 board
MV-11 board

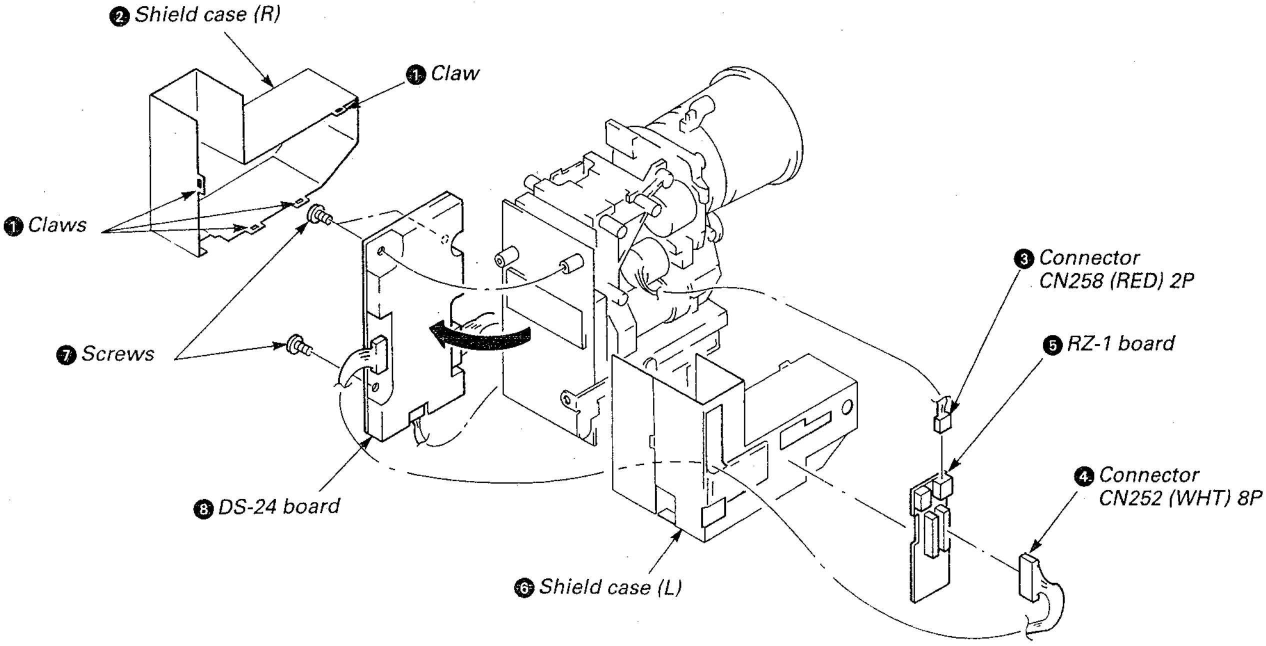
2-8. REMOVAL OF THE AW-9 BOARD AND THE LENS MOUNTING FRAME

1) Separate the camera and VTR sections according to 2-7.
2) Remove connector ❶ (CN901) (WHT).
3) Remove screw ❷ and remove AW-9 board ❸ in the direction of arrow Ⓐ while being careful of claw ❹.
4) Remove flexible board SK-21 ❻ from flexible connector ❺ (CN259) (BLK).
5) Remove the four screws ❼.
6) Remove lens mounting frame ❽ by spreading both sides in the direction of arrow Ⓑ and pulling in the direction of arrow Ⓒ .
7) Remove flexible board FP-82 ❿ from flexible connector ❾ (CN2) (BLK).
8) Remove connector ⓫ (CN254) (WHT).


❽ Lens mounting frame
❼ Screws
❼ Screws
❹ Claw
Ⓑ
Ⓑ
Ⓒ
Ⓐ
❸ AW-9 board
❷ Screw
❶ Connector CN901 (WHT) 5P
❿ Flexible board FP-82
⓫ Connector CN254 (WHT) 3P DS-24 board
❾ Flexible connector CN2 (BLK) AF-32 board
❺ Flexible connector CN259 (BLK) DS-24 board
❻ Flexible board SK-21

2-9. OPENING THE DS-24 BOARD

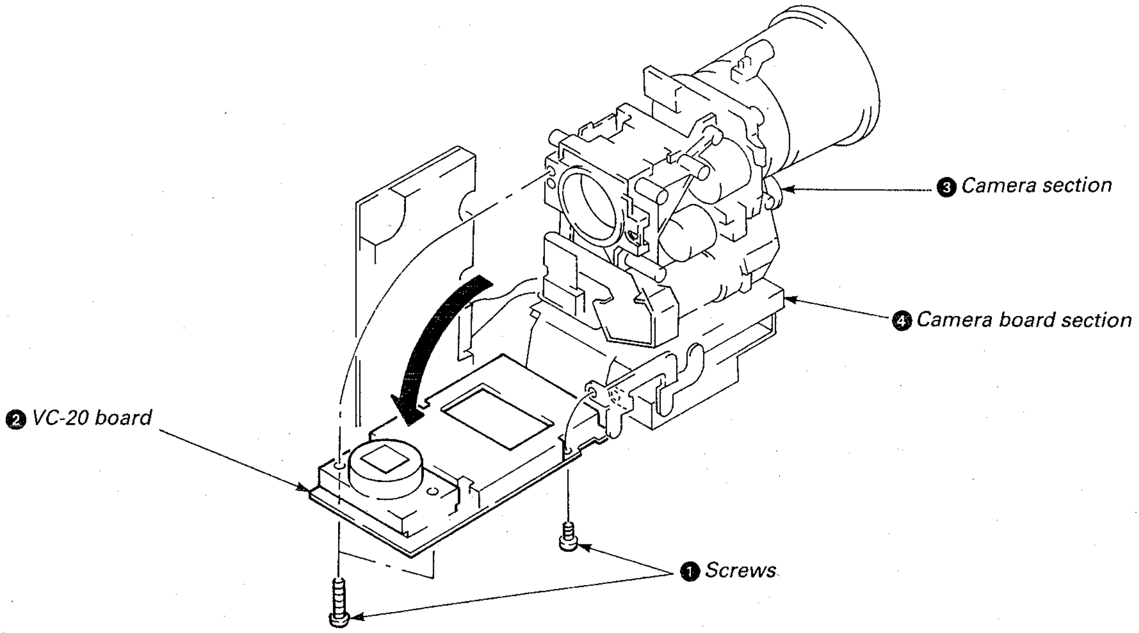
1) Remove the lens mounting frame according to 2-8.
2) Remove claw ❶ in four places and remove shield case (R) ❷.
3) Remove connector ❸ (CN258) (RED) and connector ❹ (CN252) (WHT).
4) Remove RZ-1 board ❺.
5) Remove shield case (L) ❻.
6) Remove three screws ❼ and open DS-24 board ❽.


❷ Shield case (R)
❶ Claw
❶ Claws
❼ Screws
❽ DS-24 board
❻ Shield case (L)
❸ Connector CN258 (RED) 2P
❺ RZ-1 board
❹ Connector CN252 (WHT) 8P

2-10. OPENING THE VC-20 BOARD

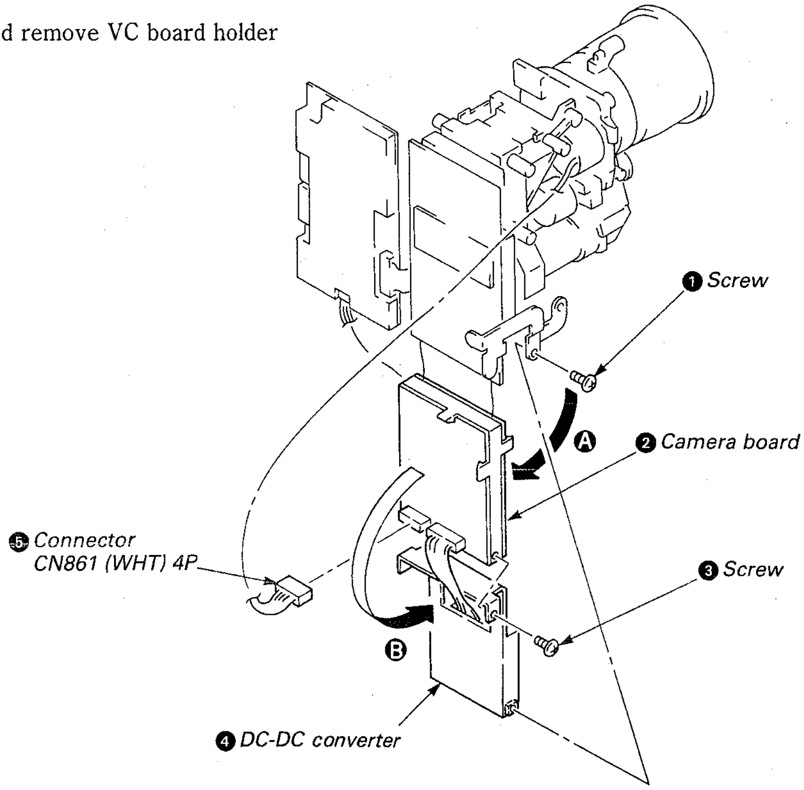
1) Open DS-24 board according to 2-9.
2) Remove three screws ❶ and open VC-20 board ❷.

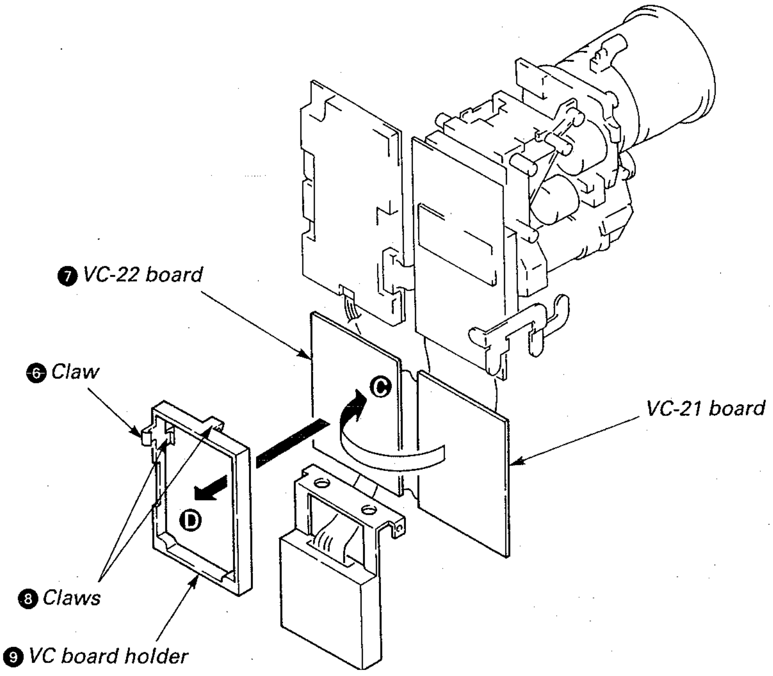
Note: When VC-20 board ❷ is opened, camera section ❸ and camera board assembly section ❹ will come apart.


❸ Camera section
❹ Camera board section
❷ VC-20 board
❶ Screws

2-11. OPENING THE CAMERA BOARD

1) Open DS-24 board according to 2-9.
2) Remove screw ❶ and open camera board ❷ in the direction of arrow Ⓐ .
3) Remove screw ❸ and open DC-DC converter ❹ in the direction of arrow Ⓑ .
4) Remove connector ❺ (CN861) (WHT).
5) Remove claw ❻ and open VC-22 board ❼ in the direction of arrow Ⓒ .
6) Remove the two claws ❽ and remove VC board holder ❾.

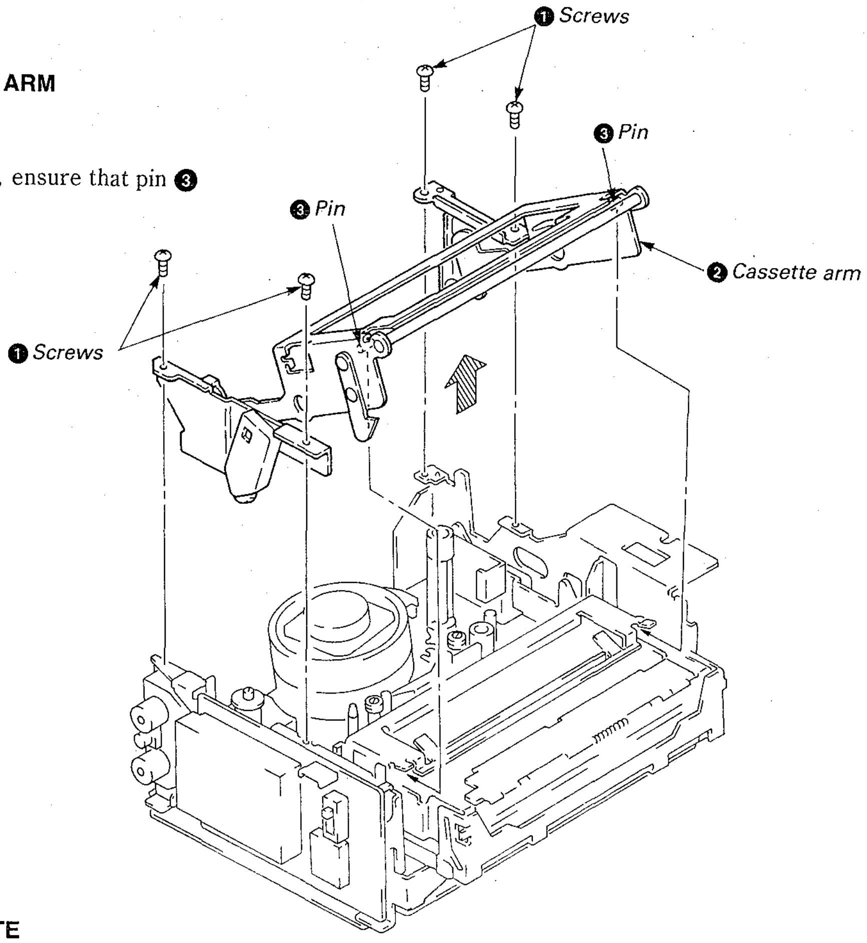

❶ Screw
Ⓐ
❷ Camera board
❺ Connector
CN861 (WHT) 4P
❸ Screw
Ⓑ
❹ DC-DC converter


❼ VC-22 board
❻ Claw
Ⓒ
VC-21 board
Ⓓ
❽ Claws
❾ VC board holder

2-12. REMOVAL OF THE CASSETTE ARM

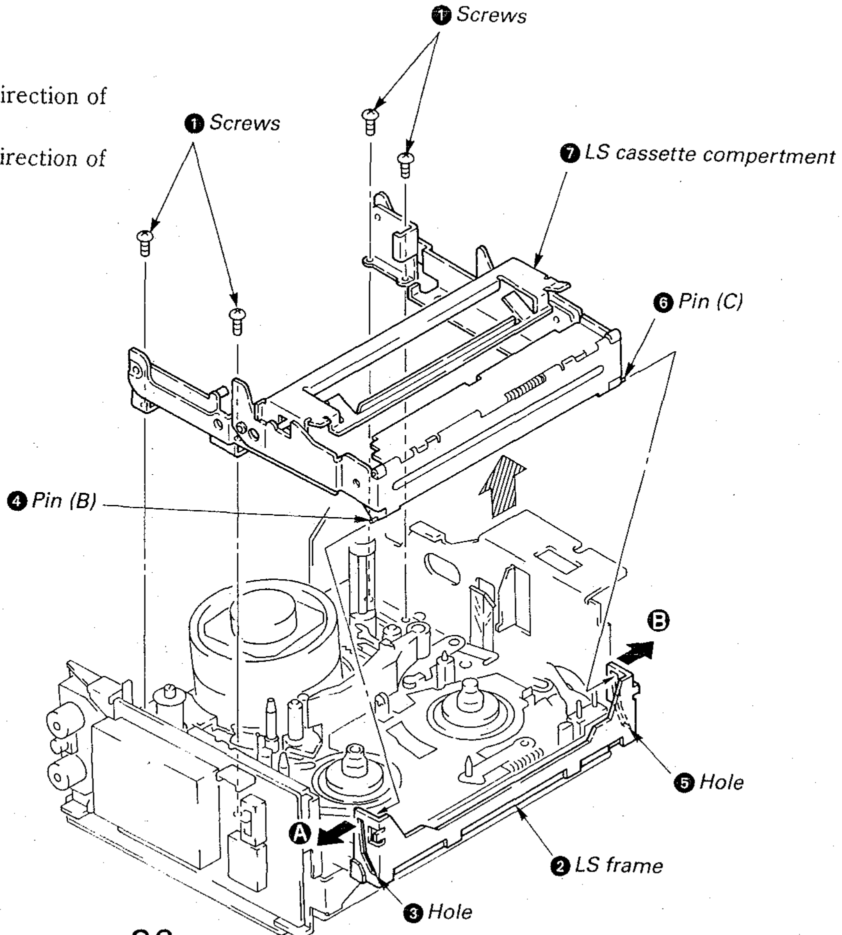
1) Remove the four screws ①.
2) Remove cassette arm ②.

Note: When mounting casseeтte arm ②, ensure that pin ③ is in its prescribed position.

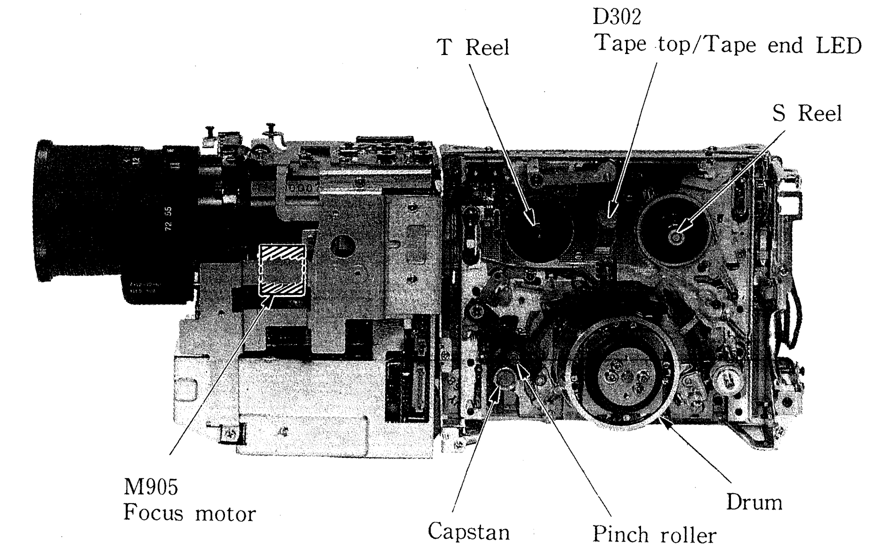

① Screws
③ Pin
③ Pin
② Cassette arm
① Screws

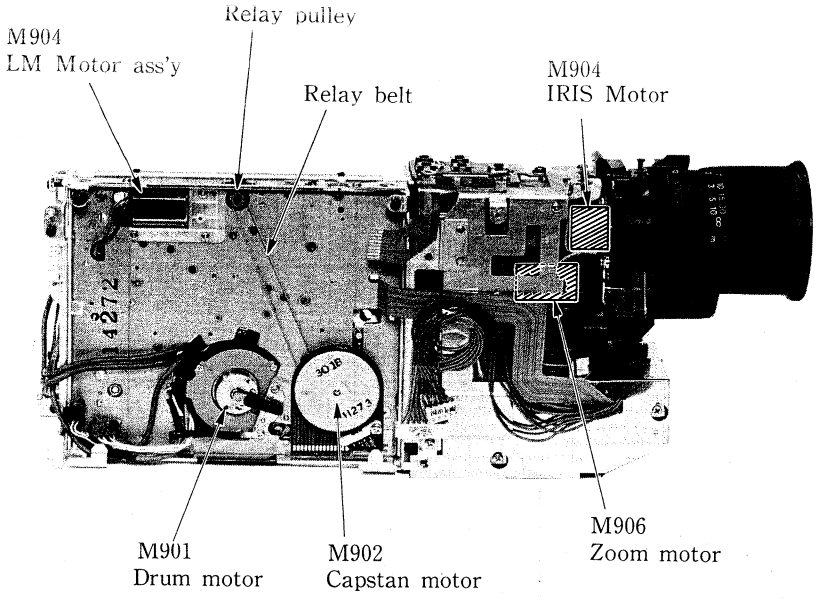
2-13. REMOVAL OF THE LS CASSETTE COMPARTMENT

1) Remove the cassette arm according to 2-12.
2) Remove the four screws ①.
3) Bend hole ③ of LS frame ② slightly in the direction of arrow Ⓐ and remove pin (B) ④.
4) Bend hole ⑤ of LS frame ② slightly in the direction of arrow Ⓑ and remove pin (C) ⑥.
5) Remove LS cassette compartment ⑦.


① Screws
① Screws
⑦ LS cassette compertment
⑥ Pin (C)
④ Pin (B)
Ⓑ
⑤ Hole
Ⓐ
② LS frame
③ Hole

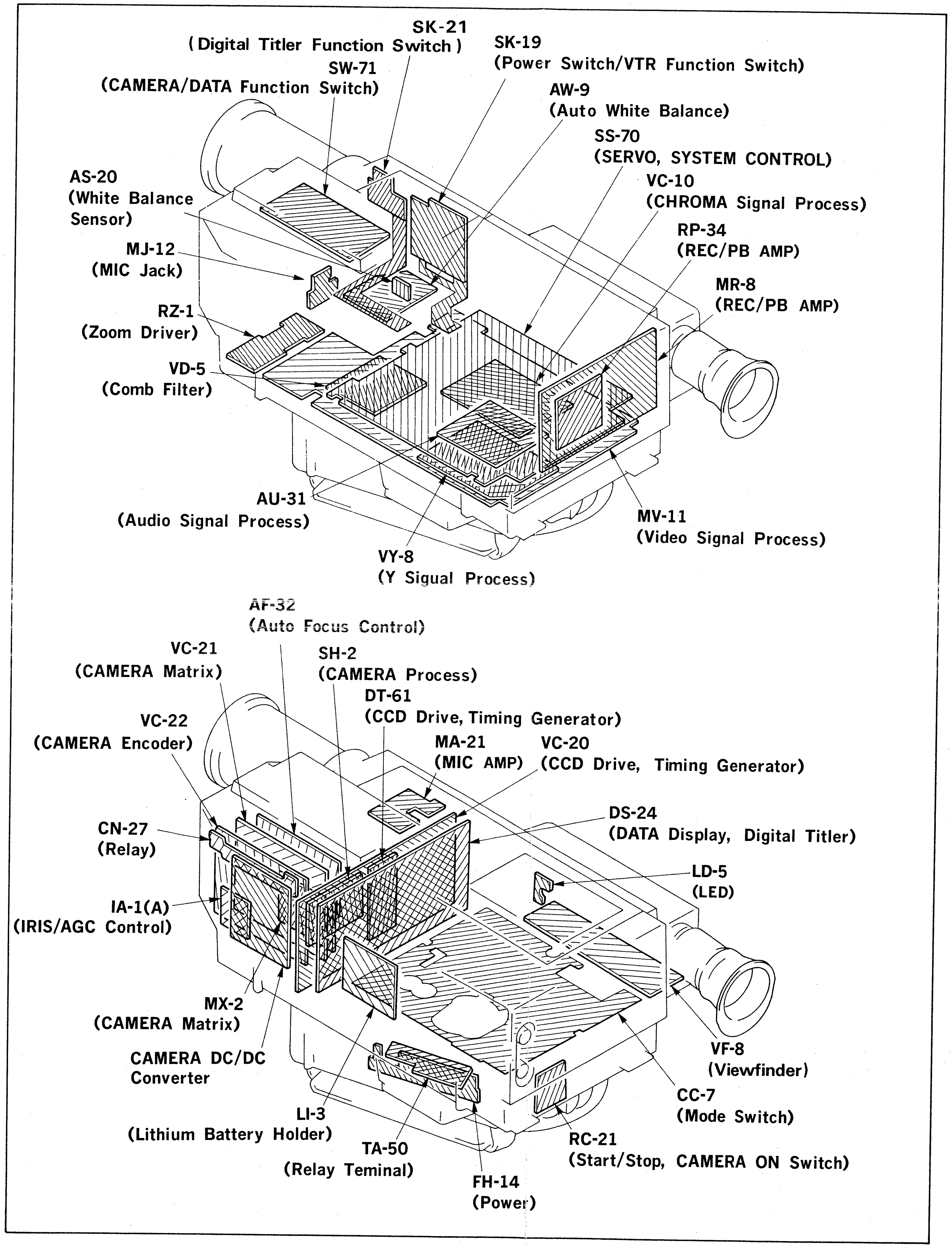
2-14. INTERNAL VIEWS


D302
Tape top/Tape end LED
T Reel
S Reel
M905
Focus motor
Capstan
Pinch roller
Drum

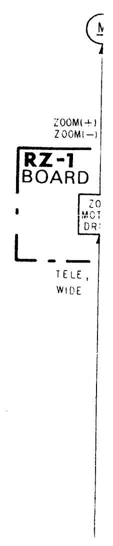

Relay pulley
M904
LM Motor ass'y
Relay belt
M904
IRIS Motor
M901
Drum motor
M902
Capstan motor
M906
Zoom motor

SECTION 3
DIAGRAM

3-1. CIRCUIT BOARDS LOCATION


SK-21
(Digital Titler Function Switch)
SK-19
(Power Switch/VTR Function Switch)
SW-71
(CAMERA/DATA Function Switch)
AW-9
(Auto White Balance)
SS-70
(SERVO, SYSTEM CONTROL)
AS-20
(White Balance Sensor)
VC-10
(CHROMA Signal Process)
RP-34
(REC/PB AMP)
MJ-12
(MIC Jack)
MR-8
(REC/PB AMP)
RZ-1
(Zoom Driver)
VD-5
(Comb Filter)
AU-31
(Audio Signal Process)
MV-11
(Video Signal Process)
VY-8
(Y Sigual Process)
AF-32
(Auto Focus Control)
VC-21
(CAMERA Matrix)
SH-2
(CAMERA Process)
DT-61
(CCD Drive, Timing Generator)
VC-22
(CAMERA Encoder)
MA-21
(MIC AMP)
VC-20
(CCD Drive, Timing Generator)
DS-24
(DATA Display, Digital Titler)
CN-27
(Relay)
LD-5
(LED)
IA-1(A)
(IRIS/AGC Control)
MX-2
(CAMERA Matrix)
CAMERA DC/DC
Converter
VF-8
(Viewfinder)
LI-3
(Lithium Battery Holder)
CC-7
(Mode Switch)
TA-50
(Relay Teminal)
RC-21
(Start/Stop, CAMERA ON Switch)
FH-14
(Power)

3-2. OVERA


ZOOM(+)
ZOOM(−)
RZ-1
BOARD
TELE
WIDE

)L)

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MP)

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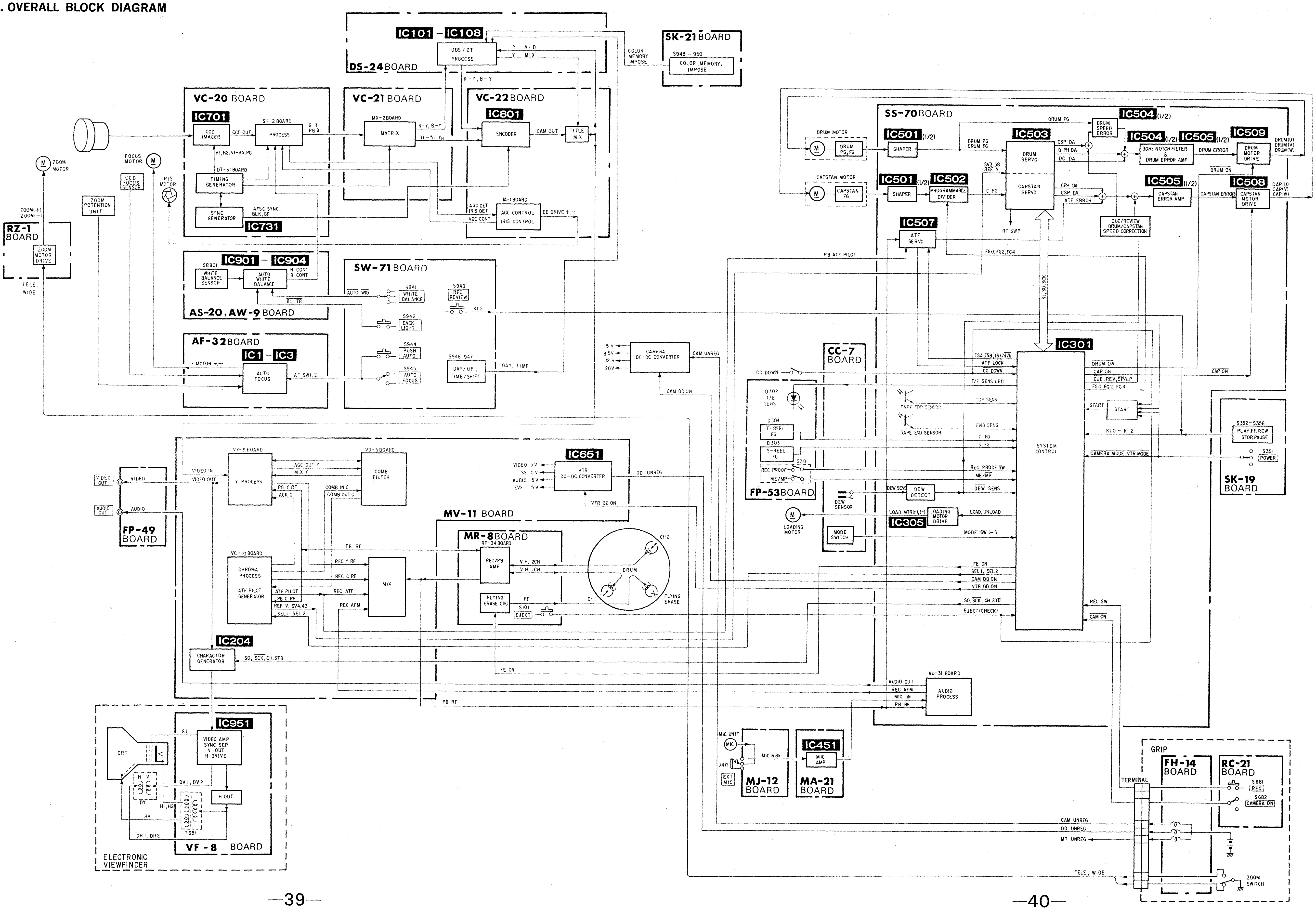
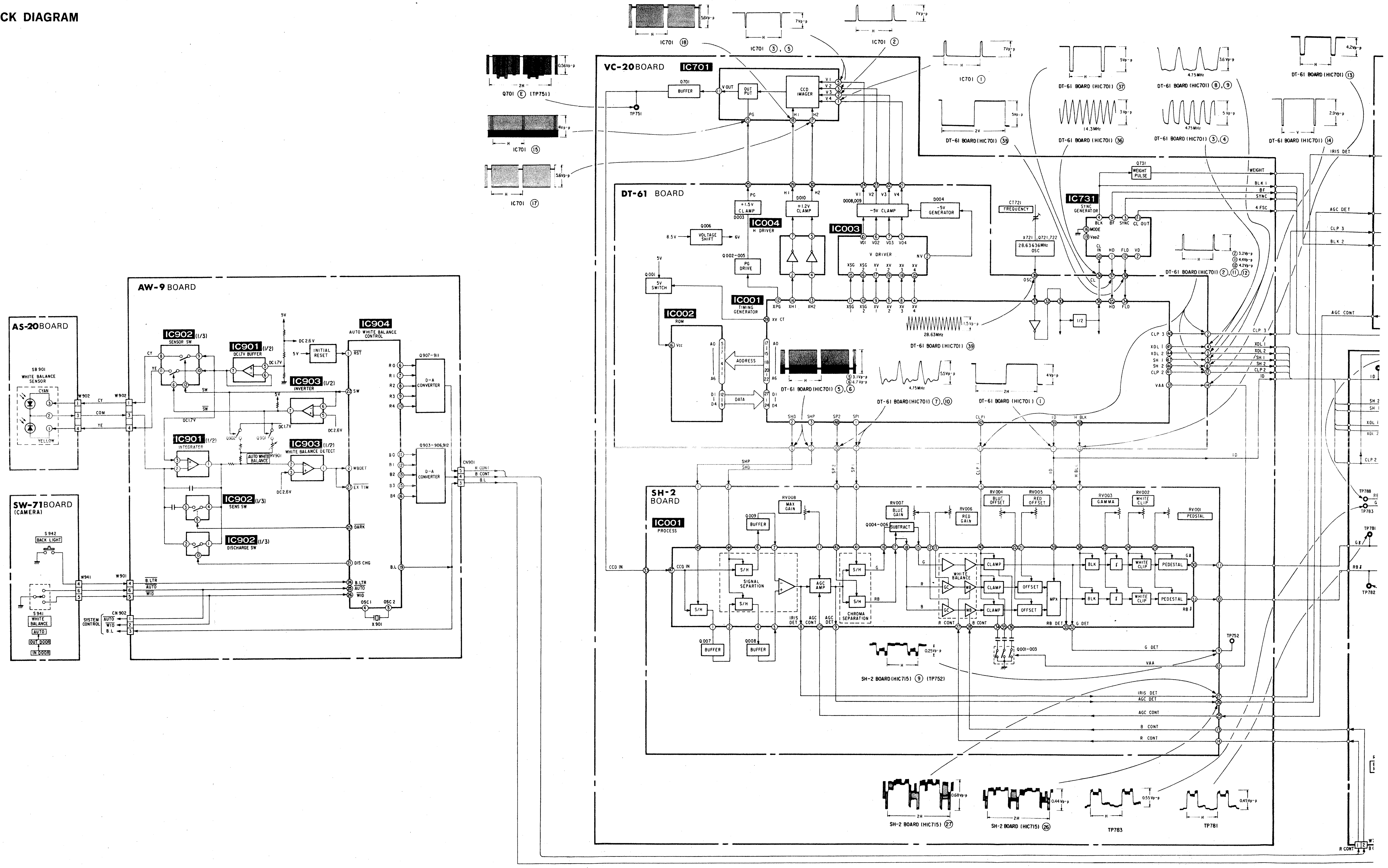
3-2. OVERALL BLOCK DIAGRAM

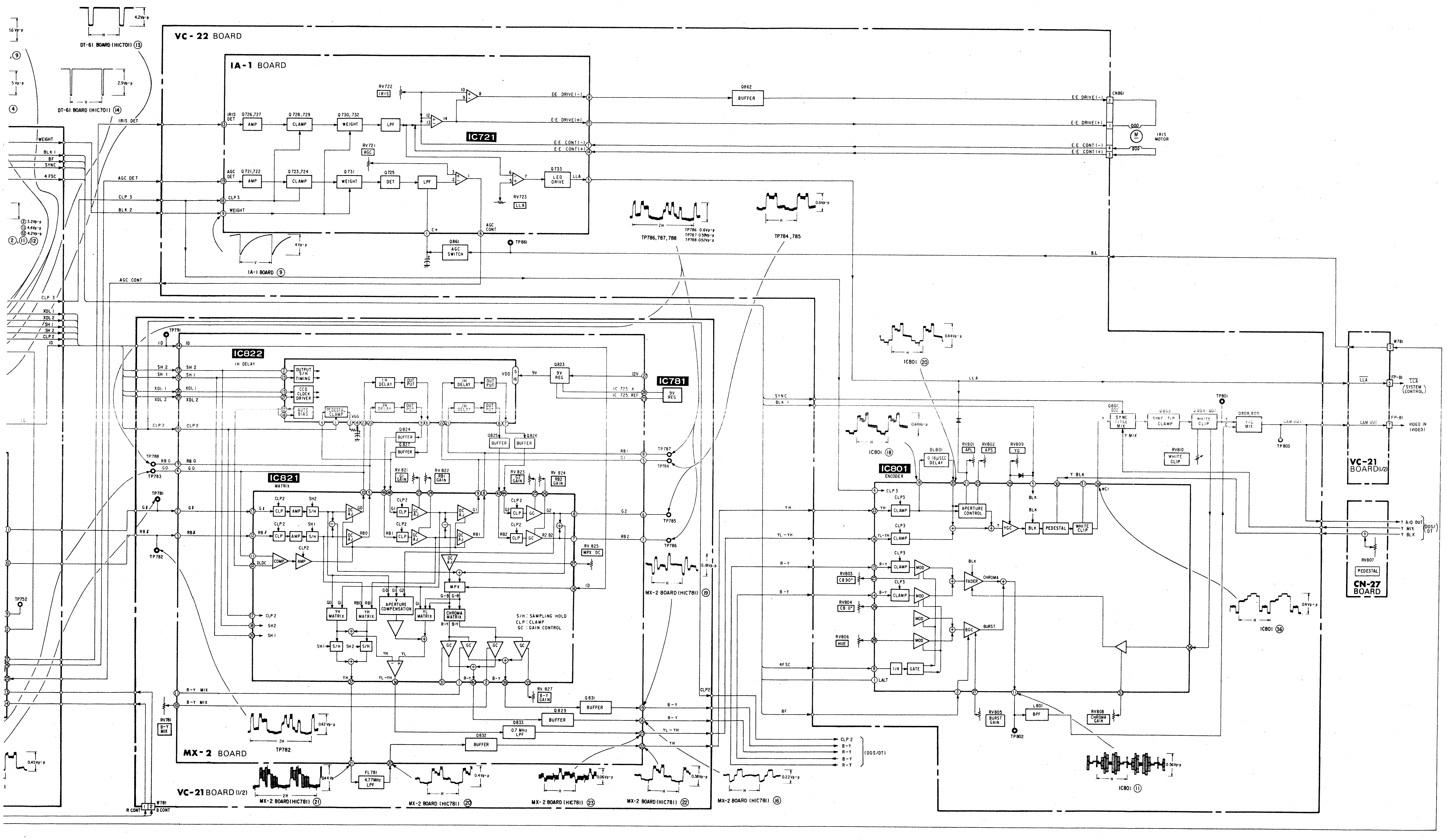


DS-24 BOARD
IC101 - IC108
DDS / DT PROCESS
Y A/D
Y MIX
SK-21 BOARD
COLOR MEMORY IMPOSE
S948 - 950
COLOR, MEMORY, IMPOSE
VC-20 BOARD
IC701
CCD IMAGER
CCD OUT
SH-2 BOARD
PROCESS
H1, H2, V1-V4, PG
DT-61 BOARD
TIMING GENERATOR
SYNC GENERATOR
4FSC, SYNC, BLK, BF
IC731
VC-21 BOARD
MX-28 BOARD
MATRIX
R-Y, B-Y
YL-YH, YH
VC-22 BOARD
IC801
ENCODER
CAM OUT
TITLE MIX
IA-1 BOARD
AGC DET, IRIS DET
AGC CONTROL
IRIS CONTROL
AGC CONT
EE DRIVE +, -
ZOOM MOTOR
FOCUS MOTOR
CCD FOCUS SENSOR
IRIS MOTOR
ZOOM POTENTION UNIT
ZOOM(+)
ZOOM(-)
RZ-1 BOARD
ZOOM MOTOR DRIVE
TELE, WIDE
AS-20, AW-9 BOARD
IC901 - IC904
S8901
WHITE BALANCE SENSOR
AUTO WHITE BALANCE
R CONT
B CONT
BL TR
SW-71 BOARD
AUTO WB
S941 WHITE BALANCE
S942 BACK LIGHT
S943 REC REVIEW
KI 2
S944 PUSH AUTO
S945 AUTO FOCUS
S946, 947 DAY/UP, TIME/SHIFT
DAY, TIME
AF-32 BOARD
IC1 - IC3
F MOTOR +, -
AUTO FOCUS
AF SW1, 2
5V
8.5V
12V
20V
CAMERA DC-DC CONVERTER
CAM UNREG
CAM DD ON
VIDEO OUT
AUDIO OUT
VIDEO
AUDIO
FP-49 BOARD
VY-8 BOARD
VIDEO IN
VIDEO OUT
Y PROCESS
AGC OUT Y
MIX Y
PB Y RF
ACK C
VD-5 BOARD
COMB FILTER
COMB IN C
COMB OUT C
IC651
VIDEO 5V
SS 5V
AUDIO 5V
EVF 5V
VTR DC-DC CONVERTER
DD UNREG
VTR DD ON
MV-11 BOARD
MR-8 BOARD
RP-34 BOARD
REC/PB AMP
V.H. 2CH
V.H. 1CH
FLYING ERASE OSC
FF
S101 EJECT
DRUM
CH 1
CH 2
FLYING ERASE
VC-10 BOARD
CHROMA PROCESS
ATF PILOT GENERATOR
PB RF
REC Y RF
REC C RF
REC ATF
REC AFM
ATF PILOT
PB C RF
REF V. SV4.43
SEL1 SEL2
MIX
IC204
CHARACTOR GENERATOR
SO, SCK, CH, STB
FE ON
PB RF
IC951
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
DV1, DV2
H OUT
H1, H2
CRT
DY
HV
T951
DH1, DH2
VF-8 BOARD
ELECTRONIC VIEWFINDER
SS-70 BOARD
DRUM MOTOR
DRUM PG, FG
IC501 (1/2)
SHAPER
DRUM PG
DRUM FG
IC503
DRUM SERVO
SV3.58 REF V
DSP DA
D PH DA
DC DA
DRUM FG
IC504 (1/2)
DRUM SPEED ERROR
IC504 (1/2)
IC505 (1/2)
30Hz NOTCH FILTER & DRUM ERROR AMP
DRUM ERROR
IC509
DRUM MOTOR DRIVE
DRUM ON
DRUM(U)
DRUM(V)
DRUM(W)
CAPSTAN MOTOR
CAPSTAN FG
IC501 (1/2)
IC502
PROGRAMMABLE DIVIDER
C FG
CAPSTAN SERVO
CPH DA
CSP DA
ATF ERROR
IC505 (1/2)
CAPSTAN ERROR AMP
CAPSTAN ERROR
IC508
CAPSTAN MOTOR DRIVE
CAP(U)
CAP(V)
CAP(W)
CUE/REVIEW DRUM/CAPSTAN SPEED CORRECTION
RF SWP
IC507
ATF SERVO
PB ATF PILOT
FG0, FG2, FG4
SI, SO, SCK
IC301
TSA, TSB, 16k/47k
ATF LOCK
CC DOWN
T/E SENS LED
DRUM ON
CAP ON
CUE, REV, SP/LP
FG0 FG2 FG4
TOP SENS
END SENS
T FG
S FG
REC PROOF SW
ME/MP
DEW SENS
LOAD, UNLOAD
MODE SW1-3
FE ON
SEL1, SEL2
CAM DD ON
VTR DD ON
SO, SCK, CH STB
EJECT (CHECK)
START
KI0 - KI2
CAMERA MODE, VTR MODE
REC SW
CAM ON
CAP ON
SYSTEM CONTROL
CC-7 BOARD
CC DOWN
D302 T/E SENS
TAPE TOP SENSOR
TAPE END SENSOR
D304 T-REEL FG
D303 S-REEL FG
S301
REC PROOF
ME/MP
FP-53 BOARD
DEW SENSOR
DEW DETECT
LOADING MOTOR
LOAD MTR(+), (-)
LOADING MOTOR DRIVE
IC305
MODE SWITCH
SK-19 BOARD
S352 - S356 PLAY, FF, REW STOP, PAUSE
S351 POWER
AU-31 BOARD
AUDIO OUT
REC AFM
MIC IN
PB RF
AUDIO PROCESS
MIC UNIT
MIC
J471
EXT MIC
MIC 6.8k
IC451
MIC AMP
MJ-12 BOARD
MA-21 BOARD
GRIP
TERMINAL
FH-14 BOARD
RC-21 BOARD
S681 REC
S682 CAMERA ON
CAM UNREG
DD UNREG
MT UNREG
TELE, WIDE
ZOOM SWITCH

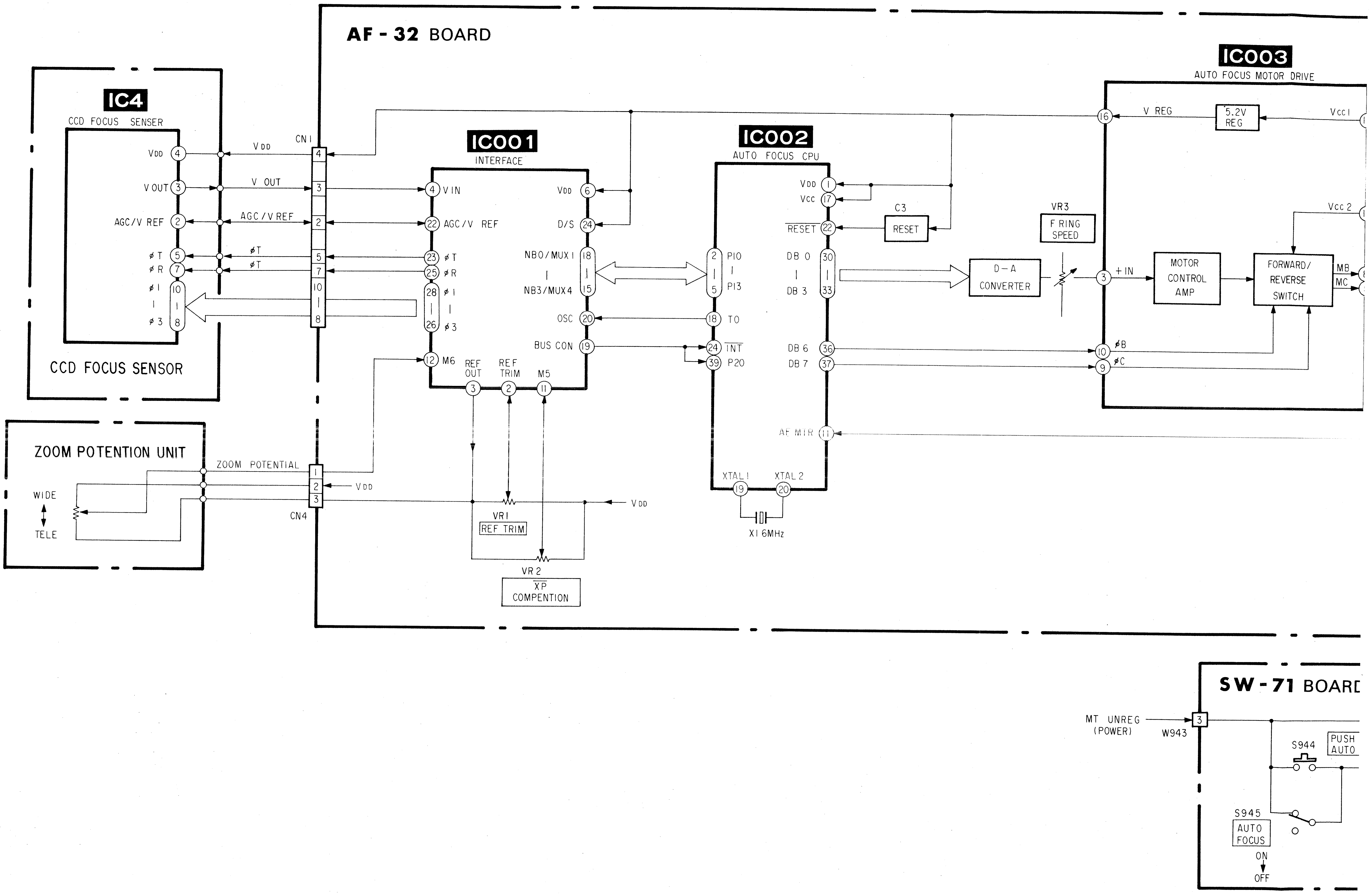
3-3. CAMERA BLOCK DIAGRAM

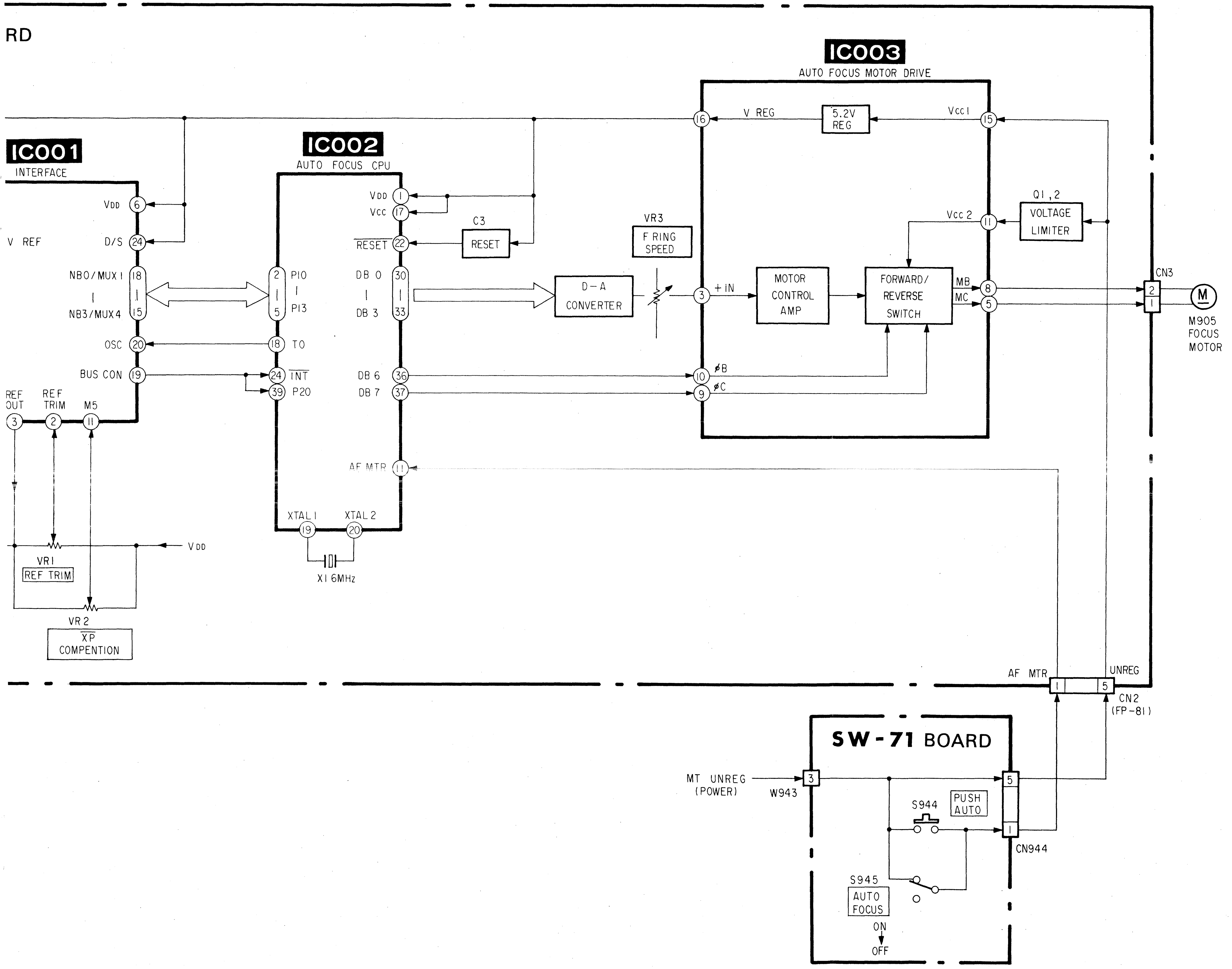


AS-20 BOARD
S8901 WHITE BALANCE SENSOR
CYAN
YELLOW
W902
CY
COM
YE
AW-9 BOARD
IC902 (1/3) SENSOR SW
IC901 (1/2) DC1.7V BUFFER
INITIAL RESET
IC904 AUTO WHITE BALANCE CONTROL
IC903 (1/2) INVERTER
IC901 (1/2) INTEGRATER
IC903 (1/2) WHITE BALANCE DETECT
AUTO WHITE BALANCE
IC902 (1/3) SENS SW
IC902 (1/3) DISCHARGE SW
D-A CONVERTER
Q907-911
Q903-906,912
CN901
R CONT
B CONT
B.L
DARK
DIS CHG
B.LTR
AUTO
WID
OSC 1
OSC 2
X901
SW-71 BOARD (CAMERA)
S942 BACK LIGHT
S941 WHITE BALANCE
AUTO
OUT DOOR
IN DOOR
W941
W901
CN902
SYSTEM CONTROL
VC-20 BOARD
IC701
Q701 BUFFER
V OUT
OUT PUT
CCD IMAGER
TP751
Q701 Ⓔ (TP751)
IC701 ⑮
IC701 ⑰
IC701 ⑱
IC701 ③, ⑤
IC701 ②
IC701 ①
DT-61 BOARD
+1.5V CLAMP
D003
IC004 H DRIVER
D010 +1.2V CLAMP
IC003 V DRIVER
-5V CLAMP
D004 -5V GENERATOR
Q006 VOLTAGE SHIFT
Q002-005 PG DRIVE
Q001 5V SWITCH
IC002 ROM
IC001 TIMING GENERATOR
ADDRESS
DATA
CT721 FREQUENCY
X721 Q721,722 28.63636MHz OSC
1/2
IC731 SYNC GENERATOR
Q731 WEIGHT PULSE
DT-61 BOARD (HIC701) ㊲
DT-61 BOARD (HIC701) ⑧, ⑨
DT-61 BOARD (HIC701) ⑬
DT-61 BOARD (HIC701) ㊴
DT-61 BOARD (HIC701) ㊱
DT-61 BOARD (HIC701) ③, ④
DT-61 BOARD (HIC701) ⑭
DT-61 BOARD (HIC701) ②, ⑪, ⑫
DT-61 BOARD (HIC701) ⑤, ⑥
DT-61 BOARD (HIC701) ⑦, ⑩
DT-61 BOARD (HIC701) ①
28.63MHz
4.75MHz
14.3MHz
IRIS DET
AGC DET
AGC CONT
CLP 3
BLK 2
WEIGHT
BLK 1
BF
SYNC
4 FSC
CLP 3
XDL 1
XDL 2
SH 1
SH 2
CLP 2
VAA
ID
SH-2 BOARD
IC001 PROCESS
CCD IN
RV008 MAX GAIN
Q009 BUFFER
RV007 BLUE GAIN
RV006 RED GAIN
RV004 BLUE OFFSET
RV005 RED OFFSET
RV003 GAMMA
RV002 WHITE CLIP
RV001 PEDESTAL
Q004-006 SUBTRACT
S/H
SIGNAL SEPARATION
AGC AMP
CHROMA SEPARATION
WHITE BALANCE
CLAMP
OFFSET
MPX
BLK
WHITE CLIP
PEDESTAL
Q007 BUFFER
Q008 BUFFER
Q001-003
IRIS DET
AGC CONT
AGC DET
R CONT
B CONT
RB DET
G DET
VAA
SH-2 BOARD (HIC715) ⑨ (TP752)
SH-2 BOARD (HIC715) ㉗
SH-2 BOARD (HIC715) ㉖
TP752
TP783
TP781
TP782
TP788

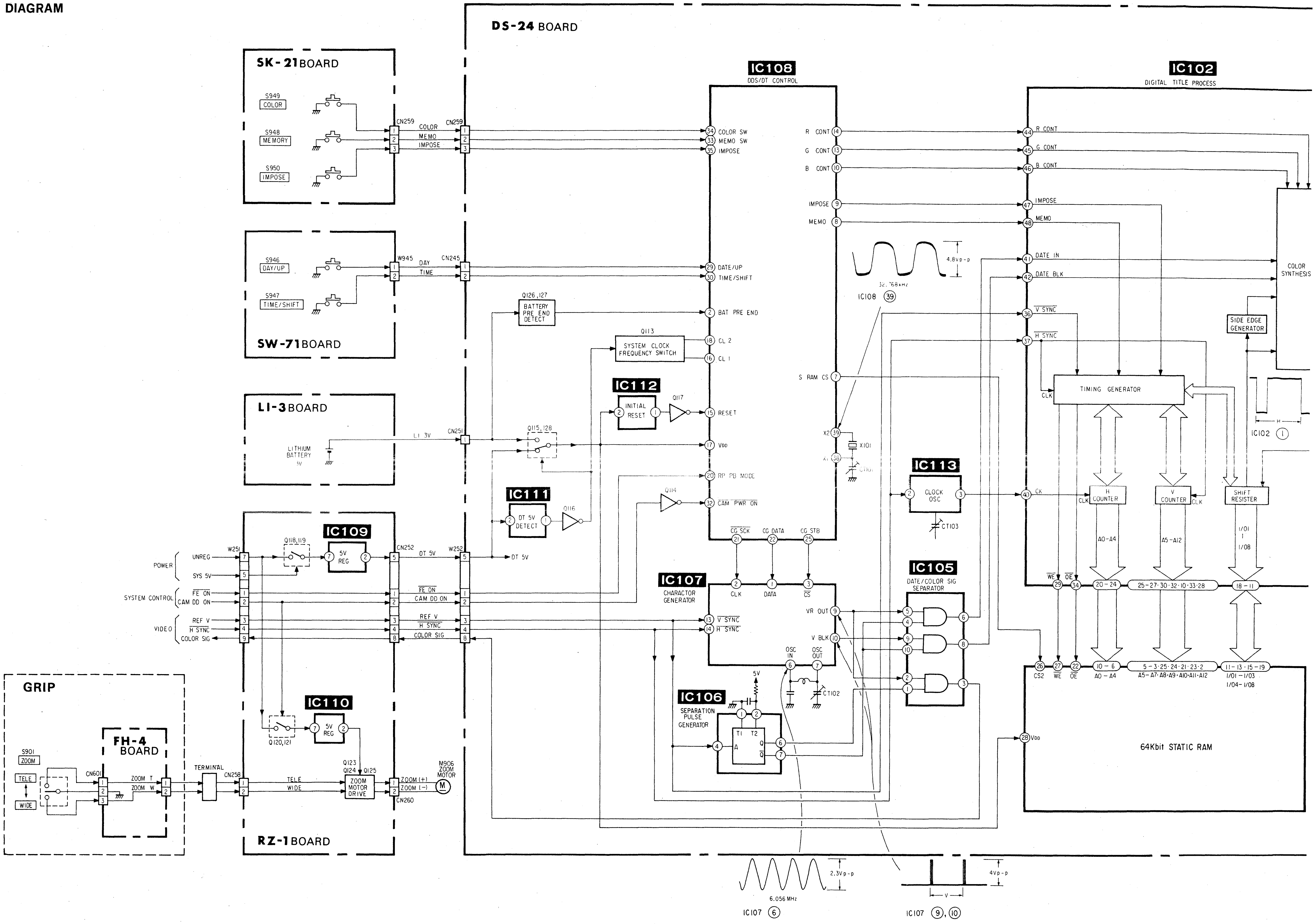

VC-22 BOARD
IA-1 BOARD
IC721
IC822
IC821
IC781
IC801
MX-2 BOARD
VC-21 BOARD (1/2)
VC-21 BOARD (1/2)
CN-27 BOARD
DT-61 BOARD (HIC701) ⑬
DT-61 BOARD (HIC701) ⑭
IA-1 BOARD ⑨
1H DELAY
MATRIX
ENCODER
BUFFER
IRIS MOTOR
AMP
CLAMP
WEIGHT
LPF
DET
LED DRIVE
AGC SWITCH
9V REG
APERTURE COMPENSATION
YH MATRIX
YL MATRIX
CHROMA MATRIX
APERTURE CONTROL
PEDESTAL
WHITE CLIP
SYNC TIP CLAMP
Y/C MIX
FADER
BURST
BPF
S/H : SAMPLING HOLD
CLP : CLAMP
GC : GAIN CONTROL
TP786, 787, 788
TP784, 785
TP782
IC801 ⑳
IC801 ⑱
IC801 ㊱
IC801 ⑪
MX-2 BOARD (HIC781) ⑲
MX-2 BOARD (HIC781) ㉑
MX-2 BOARD (HIC781) ⑳
MX-2 BOARD (HIC781) ㉓
MX-2 BOARD (HIC781) ㉒
MX-2 BOARD (HIC781) ⑯
VIDEO IN (VIDEO)
SYSTEM (CONTROL)
(DDS/DT)

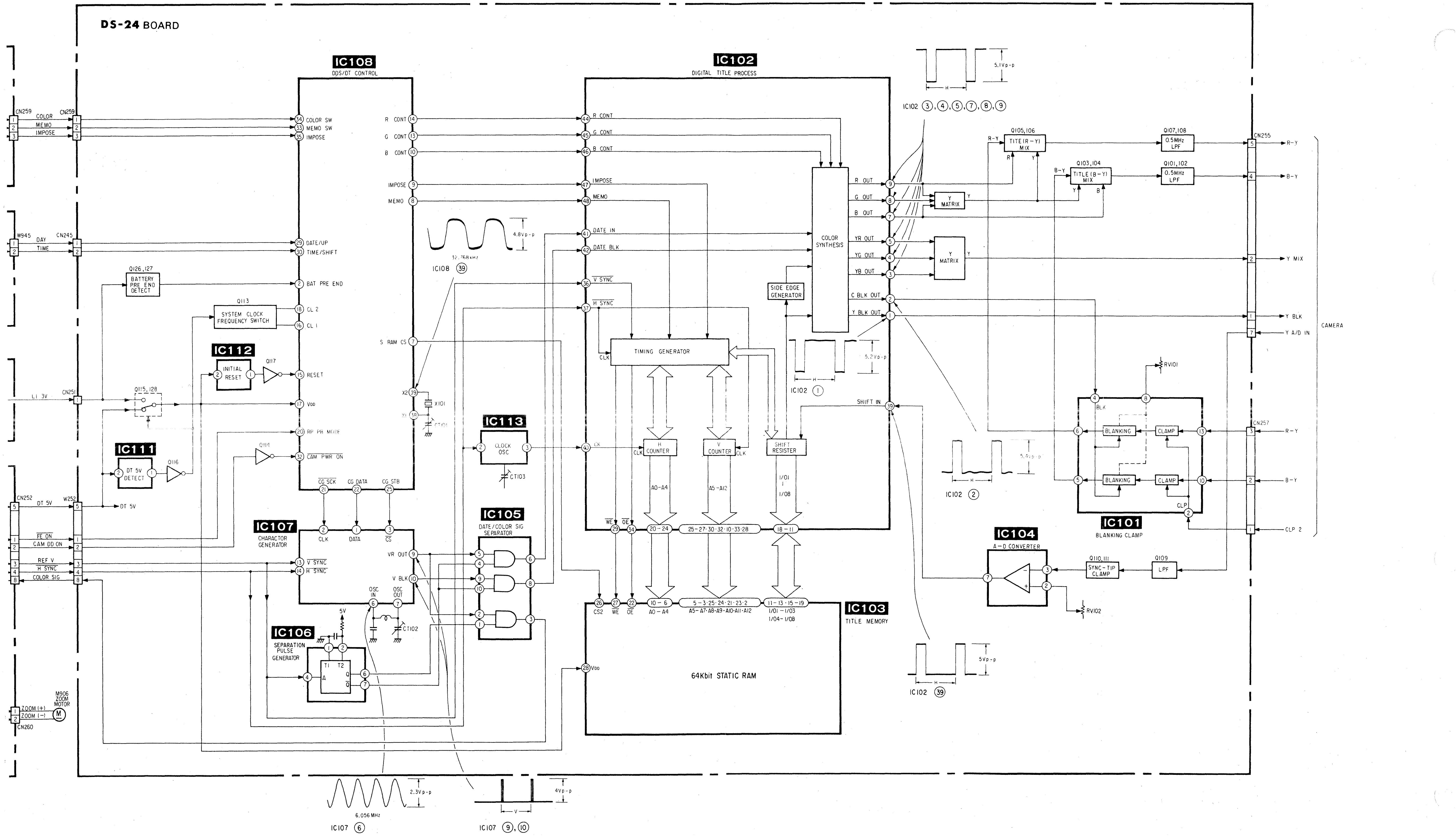
3-4. AUTO FOCUS BLOCK DIAGRAM


AF - 32 BOARD
IC4
CCD FOCUS SENSER
VDD
V OUT
AGC/V REF
φT
φR
φ1
φ3
CCD FOCUS SENSOR
CN1
V OUT
AGC/V REF
IC001
INTERFACE
V IN
AGC/V REF
VDD
D/S
NB0/MUX1
NB3/MUX4
OSC
BUS CON
M6
REF OUT
REF TRIM
M5
IC002
AUTO FOCUS CPU
P10
P13
TO
INT
P20
VDD
VCC
RESET
DB 0
DB 3
DB 6
DB 7
AF MTR
XTAL1
XTAL2
X1 6MHz
C3
RESET
VR3
F RING SPEED
D-A CONVERTER
IC003
AUTO FOCUS MOTOR DRIVE
V REG
5.2V REG
VCC1
VCC2
+IN
MOTOR CONTROL AMP
FORWARD/REVERSE SWITCH
MB
MC
φB
φC
ZOOM POTENTION UNIT
WIDE
TELE
ZOOM POTENTIAL
CN4
VDD
VR1
REF TRIM
VR2
XP COMPENTION
SW-71 BOARD
MT UNREG (POWER)
W943
S944
PUSH AUTO
S945
AUTO FOCUS
ON
OFF

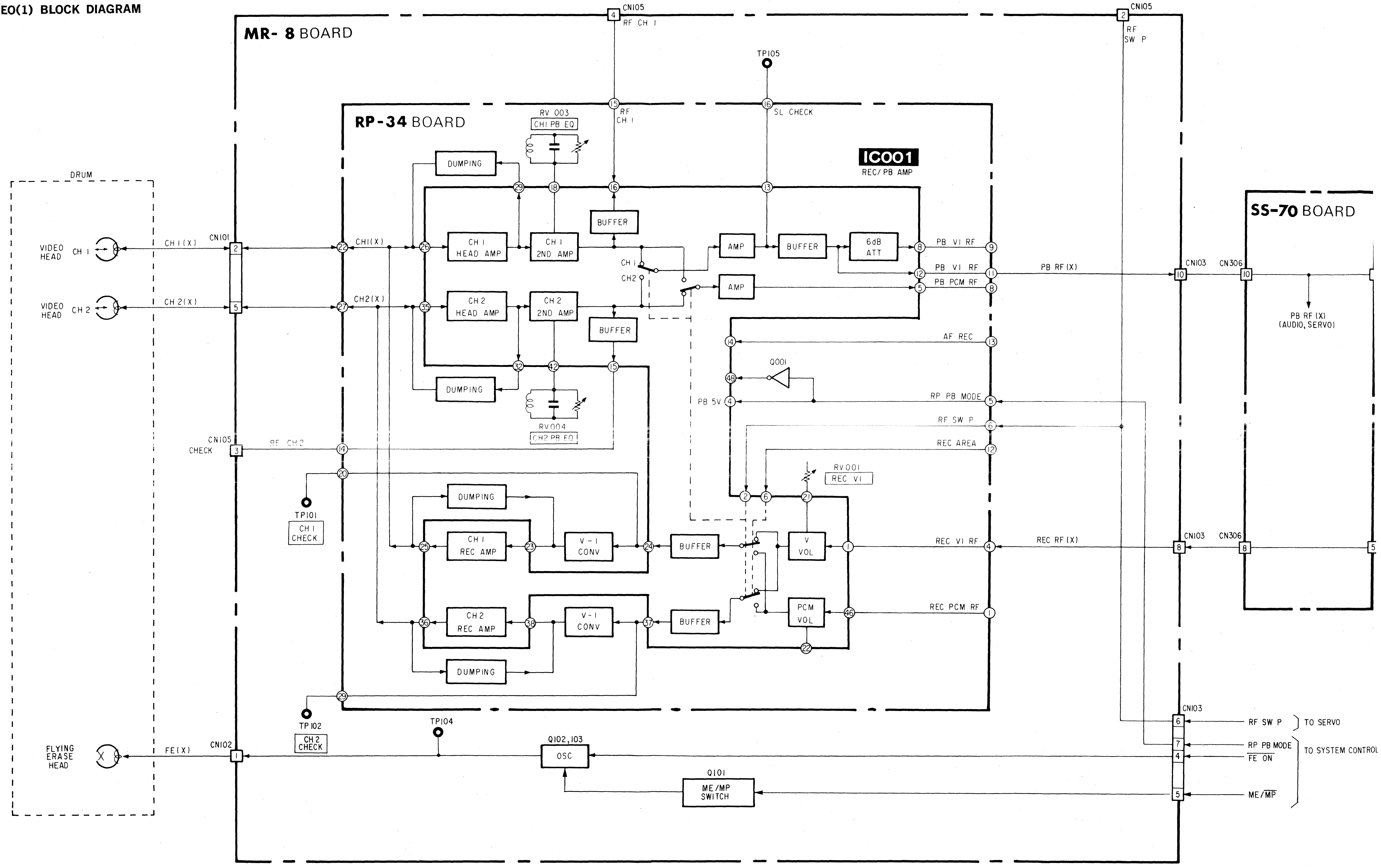

RD
IC001
INTERFACE
VDD
V REF
D/S
NB0/MUX1
NB3/MUX4
OSC
BUS CON
REF OUT
REF TRIM
M5
VR1
REF TRIM
VR2
XP COMPENTION
VDD
IC002
AUTO FOCUS CPU
P10
P13
T0
INT
P20
VDD
VCC
RESET
DB 0
DB 3
DB 6
DB 7
AF MTR
XTAL 1
XTAL 2
X1 6MHz
C3
RESET
D–A CONVERTER
VR3
F RING SPEED
IC003
AUTO FOCUS MOTOR DRIVE
V REG
5.2V REG
Vcc1
Vcc 2
+IN
MOTOR CONTROL AMP
FORWARD/ REVERSE SWITCH
MB
MC
φB
φC
Q1,2
VOLTAGE LIMITER
CN3
M
M905
FOCUS
MOTOR
AF MTR
UNREG
CN2
(FP-81)
SW-71 BOARD
MT UNREG (POWER)
W943
S944
PUSH AUTO
S945
AUTO FOCUS
ON
OFF
CN944

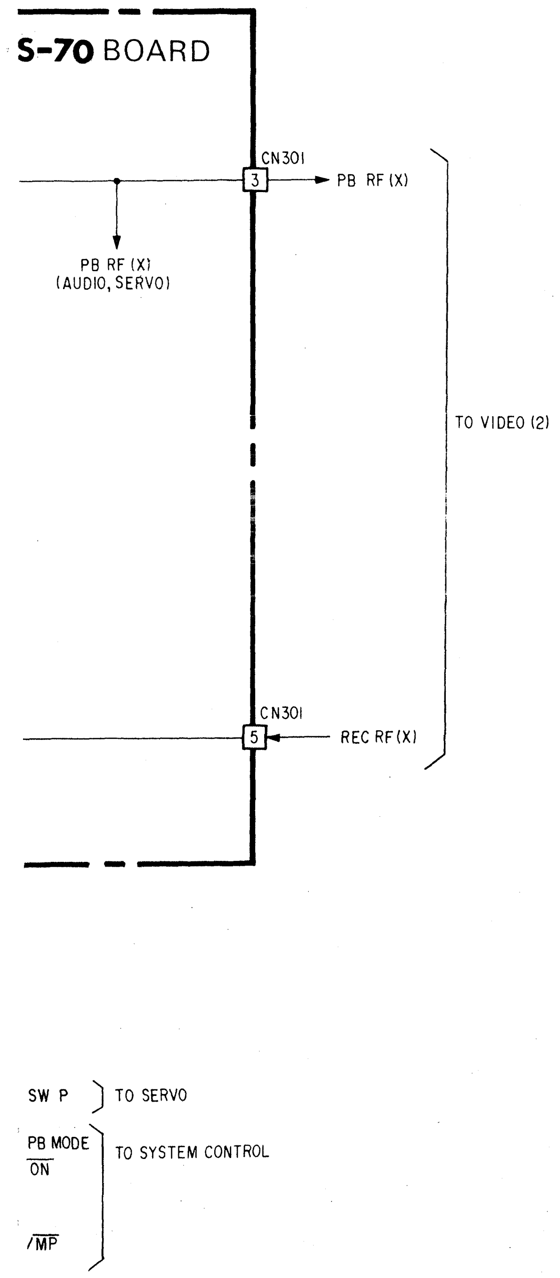
3-5. DATA DISPLAY, DIGITAL TITLER BLOCK DIAGRAM


SK-21 BOARD
S949
COLOR
S948
MEMORY
S950
IMPOSE
CN259
COLOR
MEMO
IMPOSE
CN259
SW-71 BOARD
S946
DAY/UP
S947
TIME/SHIFT
W945
DAY
TIME
CN245
LI-3 BOARD
LITHIUM
BATTERY
3V
LI 3V
CN251
RZ-1 BOARD
IC109
5V
REG
Q118,119
W251
UNREG
SYS 5V
POWER
FE ON
CAM DD ON
SYSTEM CONTROL
REF V
H SYNC
COLOR SIG
VIDEO
CN252
DT 5V
FE ON
CAM DD ON
REF V
H SYNC
COLOR SIG
W252
IC110
5V
REG
Q120,121
Q123
Q124
Q125
ZOOM
MOTOR
DRIVE
TELE
WIDE
CN258
TERMINAL
ZOOM (+)
ZOOM (−)
CN260
M906
ZOOM
MOTOR
M
GRIP
FH-4
BOARD
S901
ZOOM
TELE
WIDE
CN601
ZOOM T
ZOOM W
DS-24 BOARD
IC108
DDS/DT CONTROL
COLOR SW
MEMO SW
IMPOSE
DATE/UP
TIME/SHIFT
BAT PRE END
CL 2
CL 1
RESET
VDD
RP PB MODE
CAM PWR ON
CG SCK
CG DATA
CG STB
R CONT
G CONT
B CONT
IMPOSE
MEMO
S RAM CS
X2
X1
X101
CT101
Q126,127
BATTERY
PRE END
DETECT
Q113
SYSTEM CLOCK
FREQUENCY SWITCH
IC112
INITIAL
RESET
Q117
Q115,128
IC111
DT 5V
DETECT
Q116
Q114
DT 5V
4.8Vp-p
32.768kHz
IC108 (39)
IC113
CLOCK
OSC
CT103
IC107
CHARACTOR
GENERATOR
CLK
DATA
CS
V SYNC
H SYNC
VR OUT
V BLK
OSC
IN
OSC
OUT
5V
CT102
IC106
SEPARATION
PULSE
GENERATOR
T1
T2
A
Q
Q
IC105
DATE/COLOR SIG
SEPARATOR
IC102
DIGITAL TITLE PROCESS
R CONT
G CONT
B CONT
IMPOSE
MEMO
DATE IN
DATE BLK
V SYNC
H SYNC
CK
CLK
TIMING GENERATOR
H
COUNTER
V
COUNTER
SHIFT
RESISTER
SIDE EDGE
GENERATOR
COLOR
SYNTHESIS
IC102 (1)
H
A0−A4
A5−A12
I/O1
I/O8
WE
OE
20−24
25−27·30·32·10·33·28
18−11
CS2
WE
OE
10−6
A0−A4
5−3·25·24·21·23·2
A5−A7·A8·A9·A10·A11·A12
11−13·15−19
I/O1−I/O3
I/O4−I/O8
VDD
64Kbit STATIC RAM
2.3Vp-p
6.056 MHz
IC107 (6)
4Vp-p
V
IC107 (9), (10)

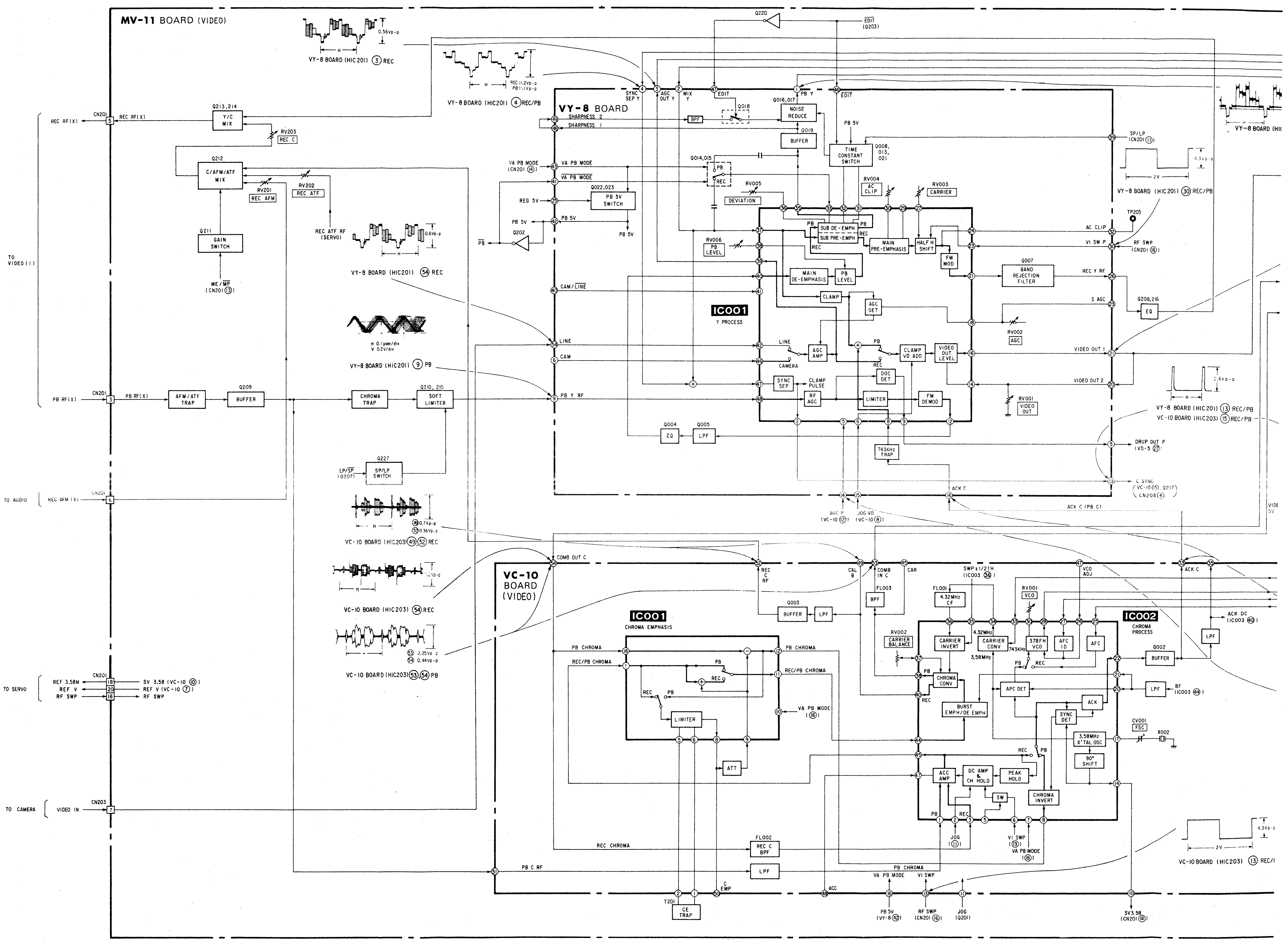

DS-24 BOARD
IC108
DDS/DT CONTROL
IC102
DIGITAL TITLE PROCESS
CN259
COLOR
MEMO
IMPOSE
COLOR SW
MEMO SW
IMPOSE
R CONT
G CONT
B CONT
IMPOSE
MEMO
W945
CN245
DAY
TIME
DATE/UP
TIME/SHIFT
Q126,127
BATTERY PRE END DETECT
BAT PRE END
Q113
SYSTEM CLOCK FREQUENCY SWITCH
CL 2
CL 1
IC112
INITIAL RESET
Q117
RESET
L1 3V
CN251
Q115,128
VDD
RP PB MODE
Q114
CAM PWR ON
IC111
DT 5V DETECT
Q116
S RAM CS
X2
X1
X101
CT101
4.8Vp-p
32.768kHz
IC108 (39)
CG SCK
CG DATA
CG STB
CN252
W252
DT 5V
FE ON
CAM DD ON
REF V
H SYNC
COLOR SIG
IC107
CHARACTOR GENERATOR
CLK
DATA
CS
V SYNC
H SYNC
VR OUT
V BLK
OSC IN
OSC OUT
5V
CT102
IC106
SEPARATION PULSE GENERATOR
T1
T2
A
Q
Q
M906
ZOOM MOTOR
ZOOM (+)
ZOOM (−)
CN260
M
IC113
CLOCK OSC
CT103
IC105
DATE/COLOR SIG SEPARATOR
DATE IN
DATE BLK
V SYNC
H SYNC
CK
TIMING GENERATOR
CLK
H COUNTER
V COUNTER
SHIFT RESISTER
A0–A4
A5–A12
I/01
I/08
WE
OE
20–24
25–27·30·32·10·33·28
18–11
CS2
WE
OE
10–6
5–3·25·24·21·23·2
11–13·15–19
A0–A4
A5–A7·A8·A9·A10·A11·A12
I/01–I/03
I/04–I/08
IC103
TITLE MEMORY
64Kbit STATIC RAM
VDD
COLOR SYNTHESIS
SIDE EDGE GENERATOR
R OUT
G OUT
B OUT
YR OUT
YG OUT
YB OUT
C BLK OUT
Y BLK OUT
SHIFT IN
5.1Vp-p
H
IC102 (3),(4),(5),(7),(8),(9)
5.2Vp-p
IC102 (1)
5.4Vp-p
IC102 (2)
5Vp-p
IC102 (39)
Y MATRIX
Y
Q105,106
TITE (R−Y) MIX
R−Y
R
Y
Q103,104
TITLE (B−Y) MIX
B−Y
Y
B
Q107,108
0.5MHz LPF
Q101,102
0.5MHz LPF
CN255
R−Y
B−Y
Y MIX
Y BLK
Y A/D IN
CAMERA
RV101
BLK
BLANKING
CLAMP
CLP
IC101
BLANKING CLAMP
CN257
R−Y
B−Y
CLP 2
IC104
A−D CONVERTER
Q110,111
SYNC-TIP CLAMP
Q109
LPF
RV102
2.3Vp-p
6.056MHz
IC107 (6)
4Vp-p
V
IC107 (9),(10)

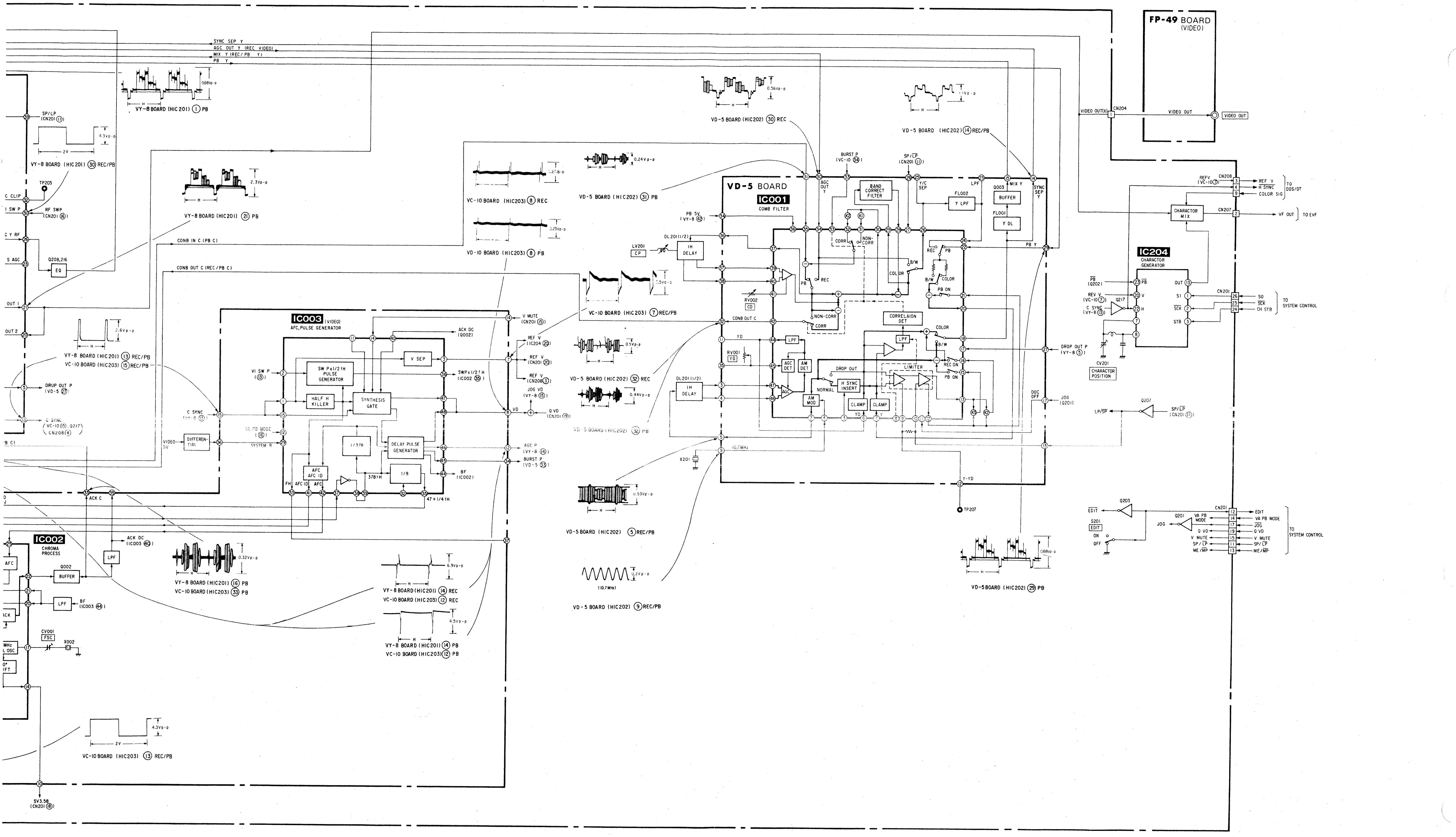
3-6. VIDEO(1) BLOCK DIAGRAM


MR- 8 BOARD
RP-34 BOARD
SS-70 BOARD
DRUM
VIDEO HEAD CH 1
VIDEO HEAD CH 2
FLYING ERASE HEAD
CH 1 (X)
CH 2 (X)
FE (X)
CN101
CN102
CN105
CN103
CN306
CHECK
RF CH 2
RF CH 1
RF SW P
TP105
TP101
CH 1 CHECK
TP102
CH 2 CHECK
TP104
SL CHECK
RV 003
CH1 PB EQ
RV 004
CH2 PB EQ
RV 001
REC VI
IC001
REC/PB AMP
DUMPING
CH 1 HEAD AMP
CH 2 HEAD AMP
CH 1 2ND AMP
CH 2 2ND AMP
BUFFER
AMP
6dB ATT
CH 1
CH 2
Q001
PB 5V
V VOL
PCM VOL
CH 1 REC AMP
CH 2 REC AMP
V - I CONV
PB VI RF
PB PCM RF
AF REC
RP PB MODE
REC AREA
REC VI RF
REC PCM RF
PB RF (X)
PB RF (X) (AUDIO, SERVO)
REC RF (X)
Q102, 103
OSC
Q101
ME/MP SWITCH
RF SW P
TO SERVO
RP PB MODE
FE ON
TO SYSTEM CONTROL
ME/MP

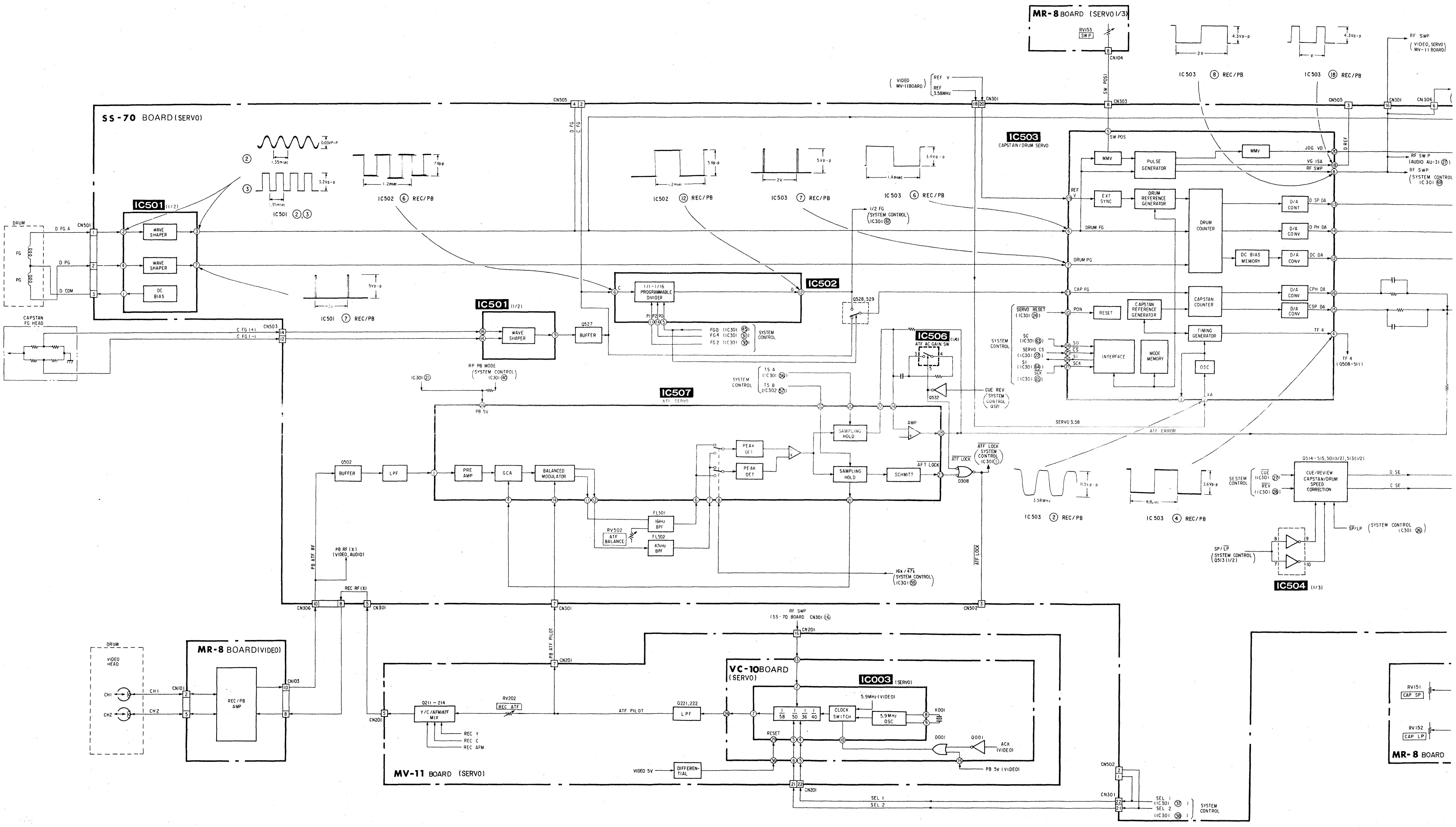

S-70 BOARD
CN301
3
PB RF (X)
PB RF (X)
(AUDIO, SERVO)
TO VIDEO (2)
CN301
5
REC RF (X)
SW P
TO SERVO
PB MODE
ON
TO SYSTEM CONTROL
/MP

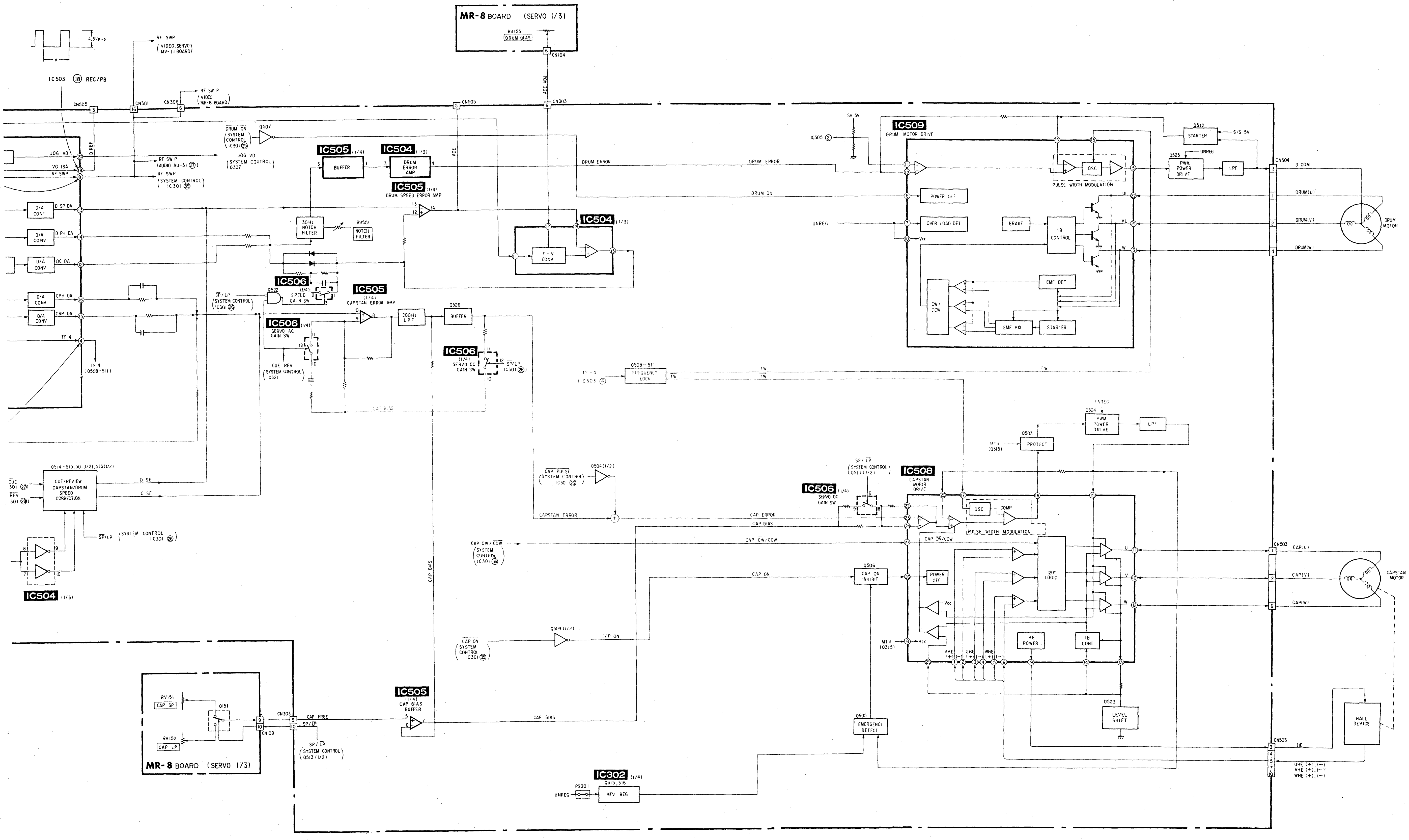
3-7. VIDEO(2) BLOCK DIAGRAM


MV-11 BOARD (VIDEO)
VY-8 BOARD (HIC201) ③ REC
VY-8 BOARD (HIC201) ④ REC/PB
VY-8 BOARD (HIC201) (54) REC
VY-8 BOARD (HIC201) ⑨ PB
VC-10 BOARD (HIC203) (49)(52) REC
VC-10 BOARD (HIC203) (54) REC
VC-10 BOARD (HIC203) (53)(54) PB
VY-8 BOARD (HIC201) (30) REC/PB
VY-8 BOARD (HIC201) ⑬ REC/PB
VC-10 BOARD (HIC203) ⑮ REC/PB
VC-10 BOARD (HIC203) ⑬ REC/PB
TO VIDEO (1)
TO AUDIO
TO SERVO
TO CAMERA
REC RF(X)
PB RF(X)
REC AFM (X)
REF 3.58M
REF V
RF SWP
VIDEO IN
CN201
CN203
Q213, 214 Y/C MIX
RV203 REC C
Q212 C/AFM/ATF MIX
RV201 REC AFM
RV202 REC ATF
REC ATF RF (SERVO)
Q211 GAIN SWITCH
ME/MP (CN201 ⑬)
AFM/ATF TRAP
Q209 BUFFER
CHROMA TRAP
Q210, 215 SOFT LIMITER
LP/SP (Q207)
Q227 SP/LP SWITCH
SV 3.58 (VC-10 ⑩)
REF V (VC-10 ⑦)
RF SWP
VY-8 BOARD
IC001 Y PROCESS
SYNC SEP Y
AGC OUT Y
MIX Y
EDIT
PB Y
Q220
EDIT (Q203)
SHARPNESS 2
SHARPNESS 1
BPF
Q018
Q016, 017 NOISE REDUCE
Q019 BUFFER
PB 5V
TIME CONSTANT SWITCH
Q008, 013, 021
VA PB MODE (CN201 ⑭)
Q014, 015
Q022, 023 PB 5V SWITCH
REG 5V
PB 5V
Q202
RV004 AC CLIP
RV003 CARRIER
RV005 DEVIATION
RV006 PB LEVEL
SUB DE-EMPH
SUB PRE-EMPH
MAIN PRE-EMPHASIS
HALF H SHIFT
FM MOD
MAIN DE-EMPHASIS
PB LEVEL
CLAMP
AGC DET
CAM/LINE
LINE
CAM
PB Y RF
CAMERA
AGC AMP
CLAMP VD ADD
VIDEO OUT LEVEL
DOC DET
SYNC SEP
CLAMP PULSE
RF AGC
LIMITER
FM DEMOD
743KHz TRAP
Q004 EQ
Q005 LPF
SP/LP (CN201 ⑪)
AC CLIP
VI SW P
TP205
RF SWP (CN201 ⑯)
REC Y RF
Q007 BAND REJECTION FILTER
S AGC
Q208, 216 EQ
RV002 AGC
VIDEO OUT 1
VIDEO OUT 2
RV001 VIDEO OUT
DRUP OUT P (VD-5 (27))
C SYNC (VC-10 ⑮, Q217) (CN208 ④)
ACK C
ACK C (PB C)
AGC P (VC-10 ⑫)
JOG VD (VC-10 ⑧)
VC-10 BOARD (VIDEO)
COMB OUT C
REC C RF
CAL B
COMB IN C
CAR
SWP x 1/2 1H (IC003 (36))
VCO ADJ
ACK C
IC001 CHROMA EMPHASIS
PB CHROMA
REC/PB CHROMA
LIMITER
ATT
VA PB MODE (⑯)
Q003 BUFFER
LPF
FL003 BPF
FL001 4.32MHz CF
RV002 CARRIER BALANCE
CARRIER INVERT
CARRIER CONV
4.32MHz
3.58MHz
743KHz
378FH VCO
AFC ID
AFC
RV001 VCO
IC002 CHROMA PROCESS
CHROMA CONV
BURST EMPH/DE EMPH
APC DET
ACK
SYNC DET
3.58MHz X'TAL OSC
90° SHIFT
CV001 FSC
X002
ACC AMP
DC AMP & CH HOLD
PEAK HOLD
SW
CHROMA INVERT
Q002 BUFFER
LPF
BF (IC003 (44))
ACK DC (IC003 (40))
JOG (⑪)
VI SWP (⑬)
VA PB MODE (⑯)
REC CHROMA
FL002 REC C BPF
PB C RF
LPF
PB CHROMA
VA PB MODE
VI SWP
ACC
C EMP
T201 CE TRAP
PB 5V (VY-8 (42))
RF SWP (CN201 ⑯)
JOG (Q201)
SV3.58 (CN201 ⑩)
VC-10 BOARD (HIC203)
VY-8 BOARD (HI

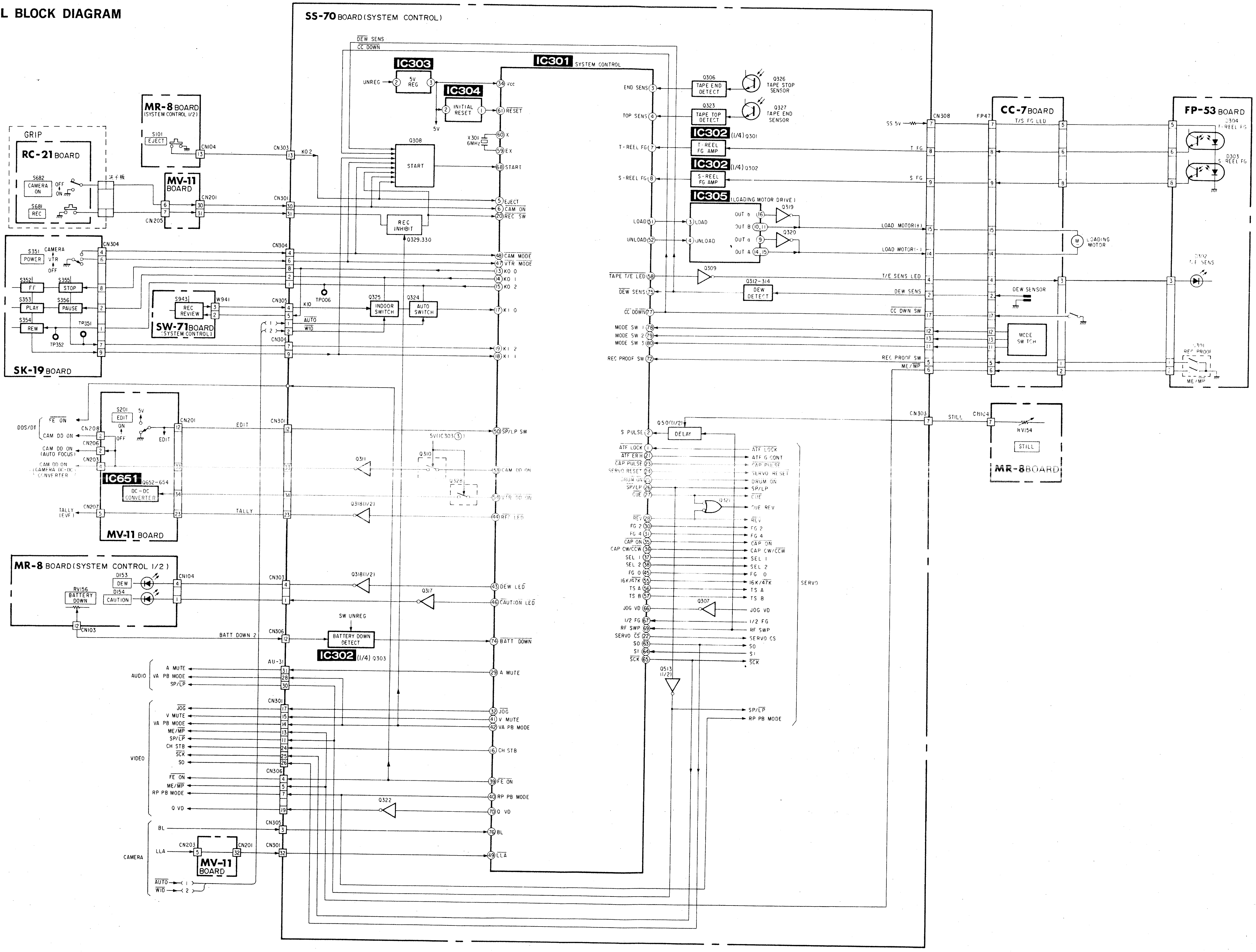

FP-49 BOARD
(VIDEO)
VIDEO OUT(X)
CN204
VIDEO OUT
VIDEO OUT
SYNC SEP Y
AGC OUT Y (REC VIDEO)
MIX Y (REC/PB Y)
PB Y
VY-8 BOARD (HIC201) ① PB
0.68Vp-p
SP/LP (CN201 ⑪)
4.3Vp-p
2V
VY-8 BOARD (HIC201) ㉚ REC/PB
TP205
C CLIP
I SW P
RF SWP (CN201 ⑯)
C Y RF
S AGC
Q208,216
EQ
OUT 1
OUT 2
2.3Vp-p
VY-8 BOARD (HIC201) ㉑ PB
COMB IN C (PB C)
COMB OUT C (REC/PB C)
2.6Vp-p
VY-8 BOARD (HIC201) ⑬ REC/PB
VC-10 BOARD (HIC203) ⑮ REC/PB
DRUP OUT P (VD-5 ㉗)
C SYNC (VC-10 ⑮, Q217) (CN208 ④)
VC-10 BOARD (HIC203) ⑧ REC
VD-10 BOARD (HIC203) ⑧ PB
0.24Vp-p
VD-5 BOARD (HIC202) ㉛ PB
0.56Vp-p
VD-5 BOARD (HIC202) ㉚ REC
1Vp-p
VD-5 BOARD (HIC202) ⑭ REC/PB
1.5Vp-p
VC-10 BOARD (HIC203) ⑦ REC/PB
IC003 (VIDEO)
AFC,PULSE GENERATOR
ACK DC (Q002)
V MUTE (CN201 ⑮)
V SEP
SW P×1/2 1H PULSE GENERATOR
HALF H KILLER
SYNTHESIS GATE
SWP×1/2 1H (IC002 ㊴)
REF V (IC204 ㉓)
REF V (CN201 ㉘)
REF V (CN208 ③)
JOG VD (VY-8 ⑮)
VD
Q VD (CN201 ⑲)
VI SW P (⑬)
C SYNC (VY-8 ⑤)
VA PB MODE (⑯)
SYSTEM R
VIDEO 5V
DIFFERENTIAL
1/378
DELAY PULSE GENERATOR
AGC P (VY-8 ⑭)
BURST P (VD-5 ㉝)
AFC AFC ID
378 1H
1/8
BF (IC002)
FH AFC ID AFC
47+1/41H
ACK C
0.5Vp-p
VD-5 BOARD (HIC202) ㉜ REC
0.44Vp-p
VD-5 BOARD (HIC202) ㉜ PB
VD-5 BOARD
IC001
COMB FILTER
PB 5V (VY-8 ㊷)
DL201 (1/2)
1H DELAY
LV201 CP
RV002 CO
COMB OUT C
RV001 YD
AGC OUT Y
BURST P (VC-10 ㉞)
SP/LP (CN201 ⑪)
BAND CORRECT FILTER
Y/C SEP
LPF
Q003 MIX Y
SYNC SEP Y
FL002 Y LPF
BUFFER
FL001 Y DL
CORR
NON-CORR
REC
PB
B/W
COLOR
PB ON
NON-CORR
CORR
CORRELAION DET
LPF
AGC DET
AM DET
AGC
AM MOD
NORMAL
DROP OUT
H SYNC INSERT
LIMITER
CLAMP
CLAMP
REC ON
PB ON
YD
Y
10.7MHz
X201
Y-YD
TP207
PB Y
DROP OUT P (VY-8 ⑤)
DOC OFF
JOG (Q201)
0.53Vp-p
VD-5 BOARD (HIC202) ⑤ REC/PB
0.2Vp-p
(10.7MHz)
VD-5 BOARD (HIC202) ⑨ REC/PB
0.68Vp-p
VD-5 BOARD (HIC202) ㉙ PB
REFV (VC-10 ⑦)
CN208
REF V
H SYNC
COLOR SIG
TO DDS/DT
CHARACTOR MIX
CN207
VF OUT
TO EVF
IC204
CHARACTOR GENERATOR
PB (Q202)
REV V (VC-10 ⑦)
C SYNC (VY-8 ⑮)
Q217
OUT
SI
SCK
STB
CN201
SO
SCK
CH STB
TO SYSTEM CONTROL
CV201
CHARACTOR POSITION
Q207
LP/SP
SP/LP (CN201 ⑪)
EDIT
S201 EDIT
ON
OFF
Q203
Q201
JOG
VA PB MODE
EDIT
VA PB MODE
JOG
Q VD
V MUTE
SP/LP
ME/MP
TO SYSTEM CONTROL
IC002
CHROMA PROCESS
AFC
Q002 BUFFER
ACK DC (IC003 ㊻)
LPF
LPF
BF (IC003 ㊹)
ACK
CV001 FSC
X002
MHz L OSC
0° IFT
0.32Vp-p
VY-8 BOARD (HIC201) ⑯ PB
VC-10 BOARD (HIC203) ㉝ PB
6.9Vp-p
VY-8 BOARD (HIC201) ⑭ REC
VC-10 BOARD (HIC203) ⑫ REC
4.5Vp-p
VY-8 BOARD (HIC201) ⑭ PB
VC-10 BOARD (HIC203) ⑫ PB
4.3Vp-p
2V
VC-10 BOARD (HIC203) ⑬ REC/PB
SV3.58 (CN201 ⑱)

3-8. SERVO BLOCK DIAGRAM


SS-70 BOARD (SERVO)
MR-8 BOARD (SERVO 1/3)
RV153 SWP
CN104
SW POS1
CN303
CN301
CN505
CN306
VIDEO MV-11 BOARD
REF V
REF 3.58MHz
IC503 CAPSTAN/DRUM SERVO
IC501 (1/2)
IC502
IC506 (1/4) ATF AC GAIN SW
IC507 ATF SERVO
IC504 (1/3)
WAVE SHAPER
DC BIAS
DRUM
FG
PG
D FG A
D PG
D COM
CN501
CAPSTAN FG HEAD
C FG (+)
C FG (−)
CN503
BUFFER
Q527
1/1-1/16 PROGRAMMABLE DIVIDER
FG0 (IC301 ㊾)
FG4 (IC301 ㊽)
FG2 (IC301 ㊼)
SYSTEM CONTROL
Q528, 529
1/2 FG (SYSTEM CONTROL) (IC301 ⑯)
IC501 ②,③
IC501 ⑦ REC/PB
IC502 ⑥ REC/PB
IC502 ⑫ REC/PB
IC503 ⑦ REC/PB
IC503 ⑥ REC/PB
IC503 ⑧ REC/PB
IC503 ⑱ REC/PB
IC503 ② REC/PB
IC503 ④ REC/PB
1.35msec
3.2Vp-p
7Vp-p
1.2msec
5Vp-p
3.4Vp-p
1.4msec
4.3Vp-p
3.58MHz
3.6Vp-p
8.8μsec
SW POS
MMV
PULSE GENERATOR
EXT SYNC
DRUM REFERENCE GENERATOR
DRUM COUNTER
D/A CONV
DC BIAS MEMORY
CAPSTAN REFERENCE GENERATOR
CAPSTAN COUNTER
RESET
TIMING GENERATOR
INTERFACE
MODE MEMORY
OSC
DRUM FG
DRUM PG
CAP FG
PON
SERVO RESET (IC301 ㉔)
SC (IC301 ㊿)
SERVO CS (IC301 ㉒)
SI (IC301 ㊸)
SCK (IC301 ㊹)
SO
CS
SI
SCK
D SP DA
D PH DA
DC DA
CPH DA
CSP DA
TF 4
TF 4 (Q508-511)
JOG VD
VG ISA
RF SWP
D REF
RF SWP (VIDEO, SERVO) (MV-11 BOARD)
RF SWP (AUDIO AU-31 ㉗)
RF SWP (SYSTEM CONTROL IC301 ㊽)
SERVO 3.58
ATF ERROR
CUE REV (SYSTEM CONTROL Q321)
Q532
TS A (IC301 ㊺)
TS B (IC302 ㊼)
RP PB MODE (SYSTEM CONTROL) (IC301 ㊷)
IC301 ㉑
PB 5V
Q502
BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
PEAK DET
SAMPLING HOLD
SCHMITT
AMP
ATF LOCK
ATF LOCK (SYSTEM CONTROL) (IC301 ①)
Q308
FL501 16kHz BPF
FL502 47kHz BPF
RV502 ATF BALANCE
16k/47k (SYSTEM CONTROL) (IC301 ㊿)
PB ATF RF
PB RF (X) (VIDEO, AUDIO)
REC RF (X)
CN306
CN301
CN502
Q514-515, 501(1/2), 513(1/2)
CUE/REVIEW CAPSTAN/DRUM SPEED CORRECTION
SESTEM CONTROL
CUE (IC301 ㉗)
REV (IC301 ㉘)
D SE
C SE
SP/LP (SYSTEM CONTROL IC301 ㉖)
SP/LP (SYSTEM CONTROL) (Q513 (1/2))
RF SWP (SS-70 BOARD CN301 ⑯)
CN201
DRUM
VIDEO HEAD
CH1
CH2
CN101
CN103
MR-8 BOARD (VIDEO)
REC/PB AMP
PB ATF PILOT
MV-11 BOARD (SERVO)
Q211-214
Y/C/AFM/ATF MIX
RV202 REC ATF
REC Y
REC C
REC AFM
ATF PILOT
Q221, 222
LPF
VIDEO 5V
DIFFERENTIAL
VC-10 BOARD (SERVO)
IC003 (SERVO)
5.9MHz (VIDEO)
1/58
1/50
1/36
1/40
CLOCK SWITCH
5.9MHz OSC
X001
RESET
D001
Q001
ACK (VIDEO)
PB 5V (VIDEO)
SEL 1
SEL 2
SEL 1 (IC301 ㊲)
SEL 2 (IC301 ㊳)
SYSTEM CONTROL
RV151 CAP SP
RV152 CAP LP
MR-8 BOARD


MR-8 BOARD (SERVO 1/3)
RV155 DRUM BIAS
CN104
CN303
CN505
CN301
CN306
RF SWP (VIDEO, SERVO MV-11 BOARD)
4.3Vp-p
IC503 ⑱ REC/PB
RF SW P (VIDEO MR-8 BOARD)
DRUM ON (SYSTEM CONTROL IC301 ㉕)
Q507
JOG VD (SYSTEM CONTROL Q307)
RF SW P (AUDIO AU-31 ㉗)
RF SWP (SYSTEM CONTROL IC301 ㊾)
JOG VD
VG ISA
RF SWP
D REF
ADE
ADE 4D2
IC505 (1/4) BUFFER
IC504 (1/3) DRUM ERROR AMP
IC505 (1/4) DRUM SPEED ERROR AMP
30Hz NOTCH FILTER
RV501 NOTCH FILTER
IC504 (1/3) F-V CONV
D/A CONT D SP DA
D/A CONV D PH DA
D/A CONV DC DA
D/A CONV CPH DA
D/A CONV CSP DA
TF 4
TF 4 (Q508-511)
SP/LP (SYSTEM CONTROL IC301 ㉖)
Q522
IC506 (1/4) SPEED GAIN SW
IC505 (1/4) CAPSTAN ERROR AMP
200Hz LPF
Q526 BUFFER
IC506 (1/4) SERVO AC GAIN SW
CUE REV (SYSTEM CONTROL Q321)
IC506 (1/4) SERVO DC GAIN SW
SP/LP (IC301 ㉖)
CAP BIAS
DRUM ERROR
DRUM ON
UNREG
5V 5V
IC505 ②
IC509 DRUM MOTOR DRIVE
POWER OFF
OVER LOAD DET
Vcc
OSC
PULSE WIDTH MODULATION
BRAKE
IB CONTROL
EMF DET
CW/CCW
EMF MIX
STARTER
UL
VL
WL
Q512 STARTER
S/S 5V
Q525 PWM POWER DRIVE
LPF
CN504
D COM
DRUM(U)
DRUM(V)
DRUM(W)
DRUM MOTOR
TF 4 (IC503 ④)
Q508-511 FREQUENCY LOCK
TW
Q514-515, 501(1/2), 513(1/2)
CUE 301 ㉗
REV 301 ㉘
CUE/REVIEW CAPSTAN/DRUM SPEED CORRECTION
D SE
C SE
SP/LP (SYSTEM CONTROL IC301 ㉖)
IC504 (1/3)
CAP PULSE (SYSTEM CONTROL IC301 ㉓)
Q504 (1/2)
CAPSTAN ERROR
CAP CW/CCW (SYSTEM CONTROL IC301 ㊱)
SP/LP (SYSTEM CONTROL Q513 (1/2))
IC506 (1/4) SERVO DC GAIN SW
UNREG
Q524 PWM POWER DRIVE
LPF
MTV (Q315)
Q503 PROTECT
IC508 CAPSTAN MOTOR DRIVE
CAP ERROR
CAP BIAS
CAP CW/CCW
OSC
COMP
PULSE WIDTH MODULATION
120° LOGIC
CAP ON
Q506 CAP ON INHIBIT
POWER OFF
Vcc
HE POWER
IB CONT
MTV (Q315)
VHE (+) (−)
UHE (+) (−)
WHE (+) (−)
D503 LEVEL SHIFT
CN503
CAP(U)
CAP(V)
CAP(W)
CAPSTAN MOTOR
HALL DEVICE
HE
VHE (+), (−)
VHE (+), (−)
WHE (+), (−)
CAP ON (SYSTEM CONTROL IC301 ㉟)
Q504 (1/2)
MR-8 BOARD (SERVO 1/3)
RV151 CAP SP
RV152 CAP LP
Q151
CN109
CN303
CAP FREE
SP/LP
SP/LP (SYSTEM CONTROL Q513 (1/2))
IC505 (1/4) CAP BIAS BUFFER
CAP BIAS
Q505 EMERGENCY DETECT
IC302 (1/4) Q315, 316
PS301
UNREG
MTV REG

3-9. SYSTEM CONTROL BLOCK DIAGRAM

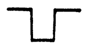
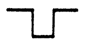
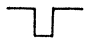
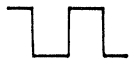
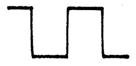
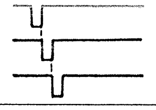
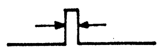
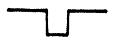
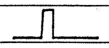


SS-70 BOARD (SYSTEM CONTROL)
IC301 SYSTEM CONTROL
IC303 5V REG
IC304 INITIAL RESET
IC302 (1/4) Q301 T-REEL FG AMP
IC302 (1/4) Q302 S-REEL FG AMP
IC305 (LOADING MOTOR DRIVE)
IC302 (1/4) Q303 BATTERY DOWN DETECT
IC651 Q652~654 DC-DC CONVERTER
Q308 START
REC INHIBIT Q329,330
Q306 TAPE END DETECT
Q323 TAPE TOP DETECT
Q326 TAPE STOP SENSOR
Q327 TAPE END SENSOR
Q325 INDOOR SWITCH
Q324 AUTO SWITCH
Q312~314 DEW DETECT
Q501(1/2) DELAY
GRIP
RC-21 BOARD
S682 CAMERA ON
S681 REC
MR-8 BOARD (SYSTEM CONTROL 1/2)
S101 EJECT
MV-11 BOARD
SK-19 BOARD
S351 CAMERA POWER VTR OFF
S352 FF
S355 STOP
S353 PLAY
S356 PAUSE
S354 REW
SW-71 BOARD (SYSTEM CONTROL)
S943 REC REVIEW
S201 EDIT
D153 DEW
D154 CAUTION
RV156 BATTERY DOWN
CC-7 BOARD
T/S FG LED
DEW SENSOR
MODE SWITCH
LOADING MOTOR
FP-53 BOARD
Q304 T-REEL FG
Q303 S-REEL FG
D302 T/E SENS
S301 REC PROOF
MR-8 BOARD
RV154
STILL
AUDIO
VIDEO
CAMERA
SERVO
A MUTE
VA PB MODE
SP/LP
JOG
V MUTE
ME/MP
CH STB
SCK
SO
FE ON
RP PB MODE
Q VD
BL
LLA
AUTO
WID
END SENS
TOP SENS
T-REEL FG
S-REEL FG
LOAD
UNLOAD
TAPE T/E LED
DEW SENS
CC DOWN
MODE SW 1
MODE SW 2
MODE SW 3
REC PROOF SW
S PULSE
ATF LOCK
ATF ERH
CAP PULSE
SERVO RESET
DRUM ON
CUE
REV
FG 2
FG 4
CAP ON
CAP CW/CCW
SEL 1
SEL 2
FG 0
16K/47K
TS A
TS B
JOG VD
1/2 FG
RF SWP
SERVO CS
SI
EJECT
CAM ON
REC SW
CAM MODE
VTR MODE
KO 0
KO 1
KO 2
KI 0
KI 1
KI 2
SP/LP SW
CAM DD ON
DEW LED
CAUTION LED
BATT DOWN
EDIT
TALLY
BATT DOWN 2
SW UNREG

3-10. PIN FUNCTIO
(IC301 ON SS

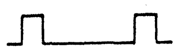
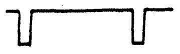
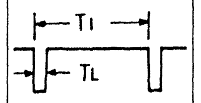
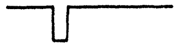
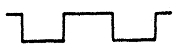
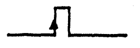
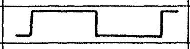
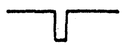
Pin No.	Signal Na
1	ATF LOCK
2	FG CONT
3	END SEN
4	TOP SENS
5	EJECT
6	CAM ON
7	T REEL F
8	S REEL F
9	TEST
10	A V_{SS}
11	A VR(−)
12	A V_{CC}
13	KO 0
14	KO 1
15	KO 2
16	CH STB
17	KI 0
18	KI 1
19	KI 2
20	REC SW
21	ATF ER H
22	SERVO CS
23	CAP PULS
24	SERVO RESE
25	DRUM ON

3-10. PIN FUNCTIONS OF SYSTEM CONTROL CPU
(IC301 ON SS-70 BOARD:MB-88551)

Pin No.	Signal Name	I/O	Signal Shape	Function	STOP	FF	REW	CUE	REV	PB	FR SEARCH FF	FR SEARCH REW	PB PAUSE	REC	REC PAUSE	REC REV
1	$\overline{\text{ATF LOCK}}$	I	Logic state	"Low" When the ATF phase servo is in the normal phase lock state during playback	H	H	H	L	L	L	L	L	L	L	L	L
2	FG CONT	I	Longic state	CAP FG dividing switching signal "Low" during CUE, REV, and UNLOAD.												
3	$\overline{\text{END SENS}}$	I		Syncronizes with the rise of $\overline{\text{TAPE T/E LED}}$to detect this level. "Low" for tape end.												
4	$\overline{\text{TOP SENS}}$	I		Syncronizes with the fall of $\overline{\text{TAPE T/E LED}}$to detect this level. "Low" for tape top.												
5	$\overline{\text{EJECT}}$	I		EJECT key input. Goes "Low" when the EJECT key is pressed.												
6	$\overline{\text{CAM ON}}$	I	Logic state	CAMERA POWER switch input. Turns on when the slide cover of REC button is lifted, going "Low".	H	H	H	H	H	H	H	H	H	L	L	L
7	T REEL FG	I		T-reel rotation detection signal input. Compared with 1/2 FG signal to detect tape slack.												
8	S REEL FG	I		S-reel rotation detection signal input. Compared with 1/2 FG signal to detect tape slack.												
9	TEST	I	——	Normally open. For IC check.												
10	A V_{SS}		——	Connected to GND.												
11	A VR(−)		——	Connected to GND.												
12	A V_{CC}		——	Connected to EVER 5 V.												
13	KO 0	O		Key matrix output. Reads out input levels of K10 to K12 when "Low" is output.												
14	KO 1	O														
15	KO 2	O														
16	CH STB	O	1μsec or more 	STROBE signal to the character generator (IC204 on MV-11 board). Strobe at rising edge (_∫‾), data and adress increment at falling edge (‾⌊_).												
17	KI 0	I		Key matrix input. When key is pressed, the pulse "Low"level of KO0 is KO2 is input.												
18	KI 1	I														
19	KI 2	I														
20	$\overline{\text{REC SW}}$	I	Logic state	REC START /STOP switch input. "Low" When this button is pressed.												
21	ATF ER H	O	Logic state	Maintained at "Low" level at UNLOAD or STANDBY(REC PAUSE), improves capstan motor rising.	H	H	H	H	H	H	H	H	H	H	L	H
22	SERVO $\overline{\text{CS}}$	O		Communication chip select signal to servo IC(IC503, CX20035). "Low" When sending serial data.												
23	$\overline{\text{CAP PULSE}}$	O	Logic state	"Low" level at FF or REW to apply full voltage to the capstan motor. CAP ON signal is PWM drive for smooth rise up. "Low" pulse is output at capstan PWM sensing.	H	L	L	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising
24	SERVO RESET	O		Initial reset pulse to servo IC (IC503, CX20035).												
25	$\overline{\text{DRUM ON}}$	O	Logic state	Drum motor ON/OFF signal. Drum motor ON at "Low" level.	H	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising	L→H rising

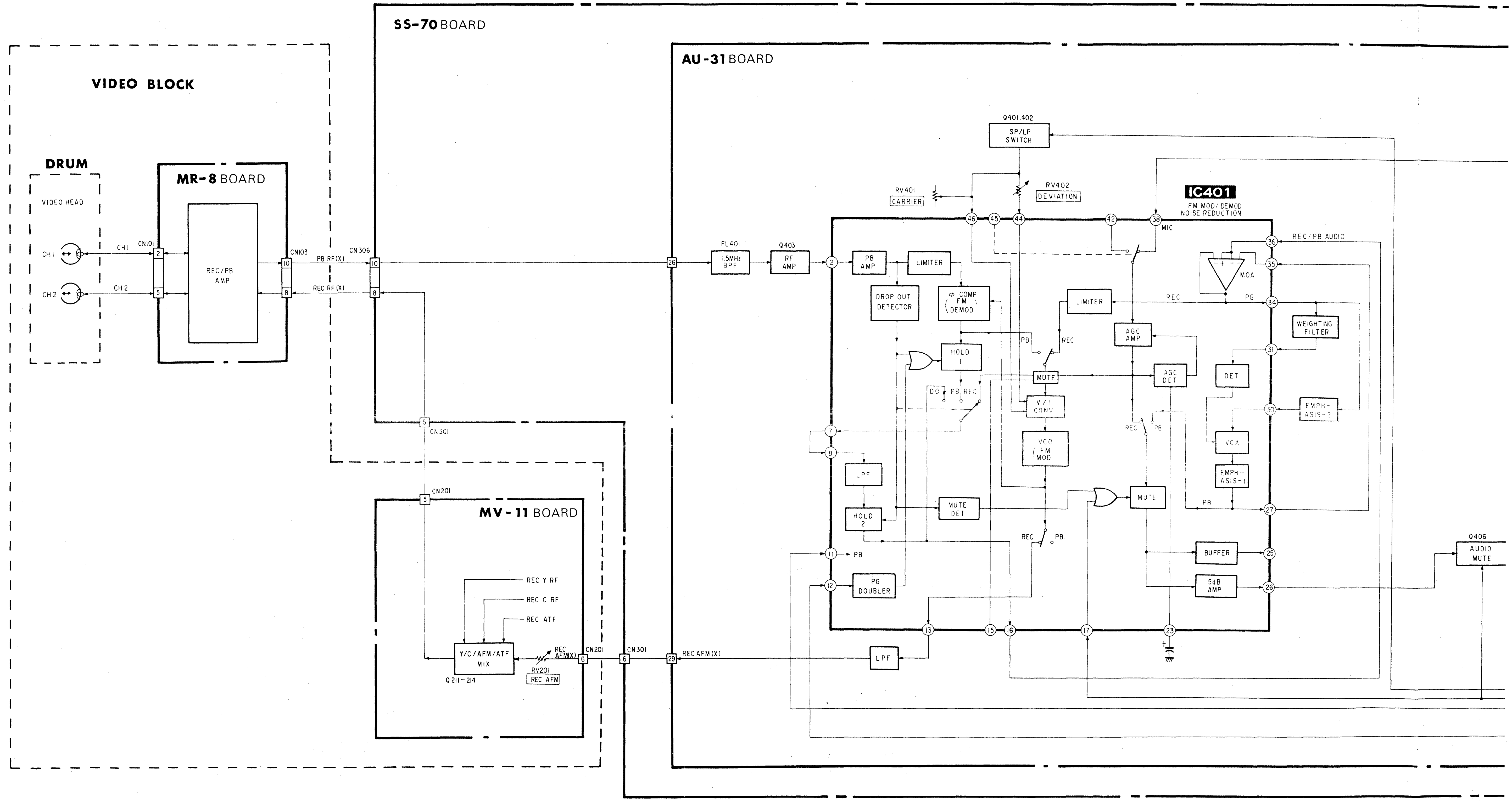
Pin No.	Signal Name	I/O	Signal Shape	Function	STOP	FF	REW	CUE	REV	PB	FR SEARCH FF	FR SEARCH REW	PB PAUSE	REC	REC PAUSE	REC REV
26	$\overline{\text{SP}}$/LP	O	Logic state	"Low" : SP mode "High" : LP mode	L	L	L	※1 H/L	※1 H/L	※1 H/L	※1 H/L	※1 H/L	L	L	L	L
27	$\overline{\text{CUE}}$	O	Logic state	"Low" during cue	H	H	H	L	H	H	L	H	H	H	H	H
28	$\overline{\text{REV}}$	O	Logic state	"Low" during review	H	H	H	H	L	H	H	L	H	H	H	H
29	A MUTE	O	Logic state	"High" during voice mute	H	H	H	H	H	L	H	H	H	L	L	H
30	FG2	O	Logic state	Signal whitch changes the divide ratio of the capstan FG divider (IC502).	L	L	L	H	H	L	H	H	L	L	L	L
31	FG4	O	Logic state		L	L	L	H	H	L	H	H	L	L	L	L
32	$\overline{\text{JOG}}$	O	Logic state	Video circuit normal／variable-speed playback switching signal. "Low" during PB pause, cue or review.	H	H	H	L	L	H	L	L	H	H	H	L
33	N.C	O	——													
34	V_{cc}	O	——	Connected to EVER 5 V.												
35	$\overline{\text{CAP ON}}$	O	Logic state	Capstan motor ON／OFF signal. Capstan motor ON at "Low" level.	H	rising L→H	rising L→H	H	H	rising L→H	H	H	H	rising L→H	H	rising L→H
36	CAP CW/$\overline{\text{CCW}}$	O	Logic state	Capstan motor rotation direction switching signal. "Low" at FWD rotation.	L	L	H	L	H	L	L	H	L	L	L	H
37	SEL1	O	Logic state	Controls the frequency of ATF REF PILOT signal. ATF REF PILOT: f1, f2, f3, f4 SEL1: H, L, H, L SEL2: H, H, L, L												
38	SEL2	O	Logic state													
39	$\overline{\text{FE ON}}$	O	Logic state	Flying erase oscillation ON／OFF signal. "Low" during playback.	H	H	H	H	H	H	H	H	H	L	H	H
40	RP PB MODE	O	Logic state	REC／PB AMP REC／PB switching signal. "High" during playback.	H	H	H	H	H	H	H	H	H	L	L	H
41	V MUTE	O	Logic state	Video mute sigal. "High" during mute."	H	H	H	L	L	L	L	L	L	L	L	L
42	VA PB MODE	O	Logic state	Video audio circuit REC／PB swtching signal. "High" during playback.	H	H	H	H	H	H	H	H	H	L	L	H
43	$\overline{\text{DEW LED}}$	O	Logic state	Dew condensation warning LED ON／OFF signal. "Low" during condensation.												
44	$\overline{\text{REC LED}}$	O	Logic state	REC (tally) LED ON／OFF signal. "Low" during recording.	H	H	H	H	H	H	H	H	H	L	H	H
45	FG0	O	Logic state	Signal which changes the divide ratio of the capstan FG divider (IC502) . See FG2 and FG4 signals.	H	H	H	L	L	H	L	L	H	H	H	H
46	$\overline{\text{CAUTION LED}}$	O	Logic state	Abnormal condition warning LED ON／OFF signal. On at "Low". Flickers during 4 Hz at clogging or battery down.												
47	$\overline{\text{VTR MODE}}$	I	Logic state	Power mode switch input. "Low" in VCR mode.	L	L	L	L	L	L	L	L	L	H	H	H
48	$\overline{\text{CAM MODE}}$	I	Logic state	Power mode switch input. "Low" in camera mode.	H	H	H	H	H	H	H	H	H	L	L	L
49	$\overline{\text{LLA}}$	I	Logic state	Insufficient light alarm signal input. "Low" during insufficient light.												
50	$\overline{\text{SP}}$/LP SW	I	Logic state	SP／LP mode switching input. "High" in LP mode.												

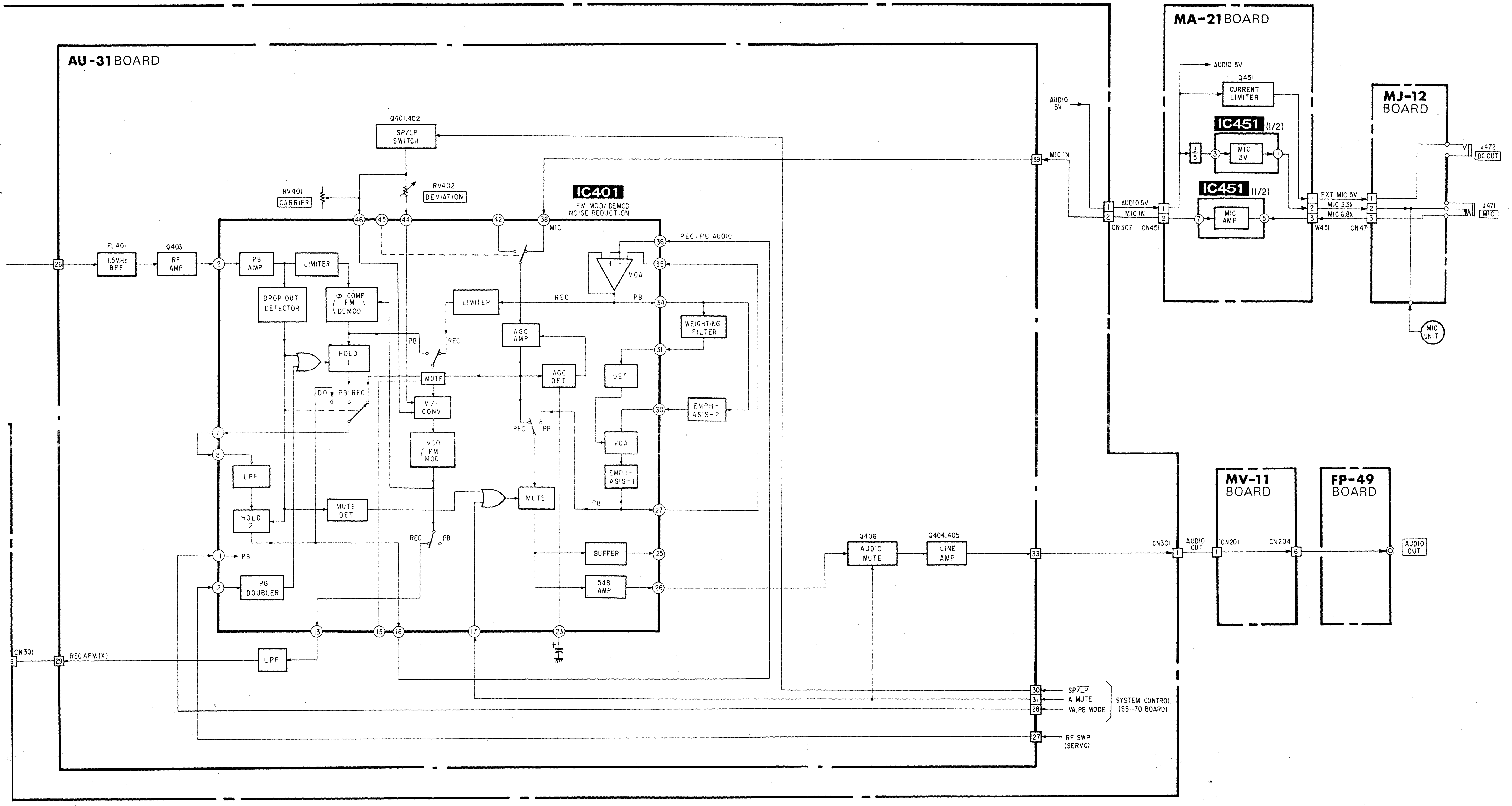
※1 Dependent upon recording mode (SP/LP) of playback tape.

Pin No.	Signal Name	I/O	Signal Shape	Function	STOP	FF	REW	CUE	REV	PB	FR SEARCH FF	FR SEARCH REW	PB PAUSE	REC	REC PAUSE	REC REV
51	LOAD	O	Logic state	Loading motor control signal.												
52	UNLOAD	O	Logic state	Signal name \ Operation: LOAD / UNLOAD / BRAKE LOAD: H / L / H UNLOAD: L / H / H												
53	$\overline{\text{CAM DD ON}}$	O	Logic state	Camera power supply control. On at "Low".	H	H	H	H	H	H	H	H	H	L	L	L
54	$\overline{\text{VTR DD ON}}$	O	Logic state	VTR power supply control. On at "Low".	L	L	L	L	L	L	L	L	L	H	H	H
55	16K/$\overline{\text{47K}}$	O	Logic state	ATF/BPF switching signal. "Low" at detection of ATF error on f_1 and f_2 tracks. "High" during detection of ATF error on f_2 and f_4 tracks.												
56	TS A	O		ATF error sampling hold signal. "Low" during sampling. "High" during hold.												
57	TS B	O		ATF lock sampling hold signal. "Low" during sampling. "High" during hold.												
58	$\overline{\text{TAPE T/E LED}}$	O		Tape top/end detection LED ON/OFF signal. Mode: REC/PB / CUE/REV / FF/REW T_I: 100 / 14 / 2 T_L: 1 / 1 / 1 (Unit:msec)												
59	EX	I		} 6.0MHz crystal oscillation connecting pin.												
60	X	I														
61	$\overline{\text{RESET}}$	I		Reset at "Low".												
62	NC															
63	SO	O	Serial signal (pulse)	Serial communication output to servo IC (IC503 CX20035), chracter generator (IC204 on MV-11 board, μPD6105G) .												
64	SI	I	Serial signal (pulse)	Serial communication input from servo IC (IC503, CX20035) .												
65	$\overline{\text{SCK}}$	O	Clock pulse	Serial communication clok pulse output.												
66	JOG VD	I		Q VD signal producing generation timing pulse from servo IC.												
67	1/2FG	I		The signal obtained by capstan FG devided by 1/2. Counts tape running distance at edit recording.												
68	START	I		Releases CPU sleep mode at the rise (⌠) of pulse input.	L	L	L	H	H	L	H	H	L	L	L	H
69	RF SW PULSE	I		RF switch pulse input.												
70	Q VD	O		Outputs the quasi VD signal to be inserted in the video signal during variable-speed playback.	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H	H	H
71	V_{SS}	—	———	Connected to GND.	H	H	H	H	H	H	H	H	H	H	H	H
72	REC PROOF SW	I	Logic state	"Low" when cassette's error erasure prevention switch is set to the erasure prevention side.	H	H	H	H	H	H	H	H	H	H	H	H

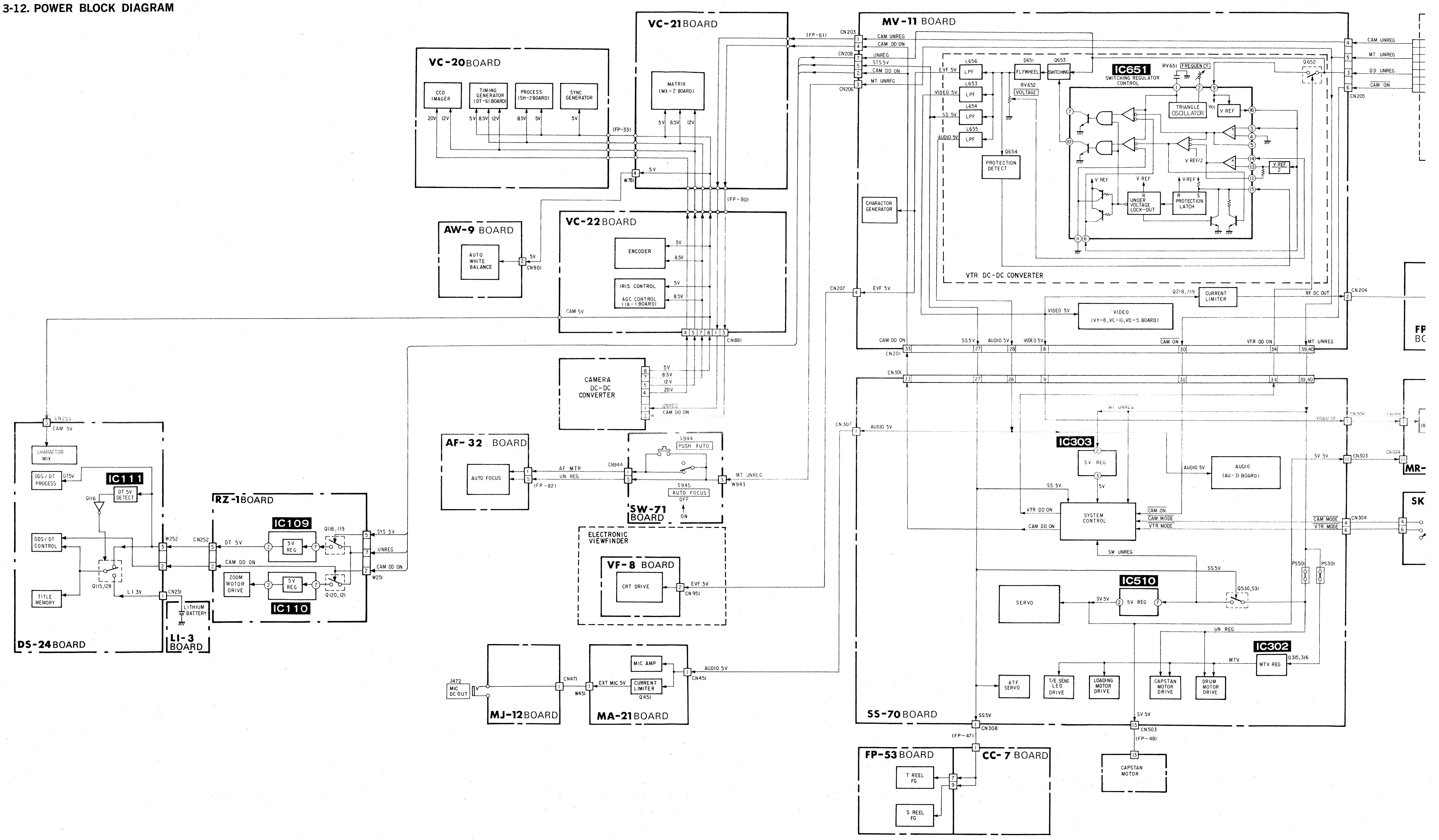
Pin No.	Signal Name	I/O	Signal Shape	Function	STOP	FF	REW	CUE	REV	PB	FR SEARCH FF	FR SEARCH REW	PB PAUSE	REC	REC PAUSE	REC REV
73	N.C			Open												
74	BAT DOWN	I	Logic state	"Low" during low battery voltage.												
75	$\overline{\text{DEW SENS}}$	I	Logic state	"Low" during condensation (dew) .												
76	BL	I	Logic state	BACK LIGHT (back light correction) switch input for EVF display. "Low" during back light correction.												
77	$\overline{\text{CC DOWN}}$	I	Logic state	Cassette compartment down switch input. "High" during cassette compartment is up;"Low" during cassette compartment down.	L	L	L	L	L	L	L	L	L	L	L	L
78	MODE SW1	I	Logic state	Mechanical mode switch input (3-bit configuration, for mechanical position detection) .												
79	MODE SW2	I	Logic state													
80	MODE SW3	I	Logic state													

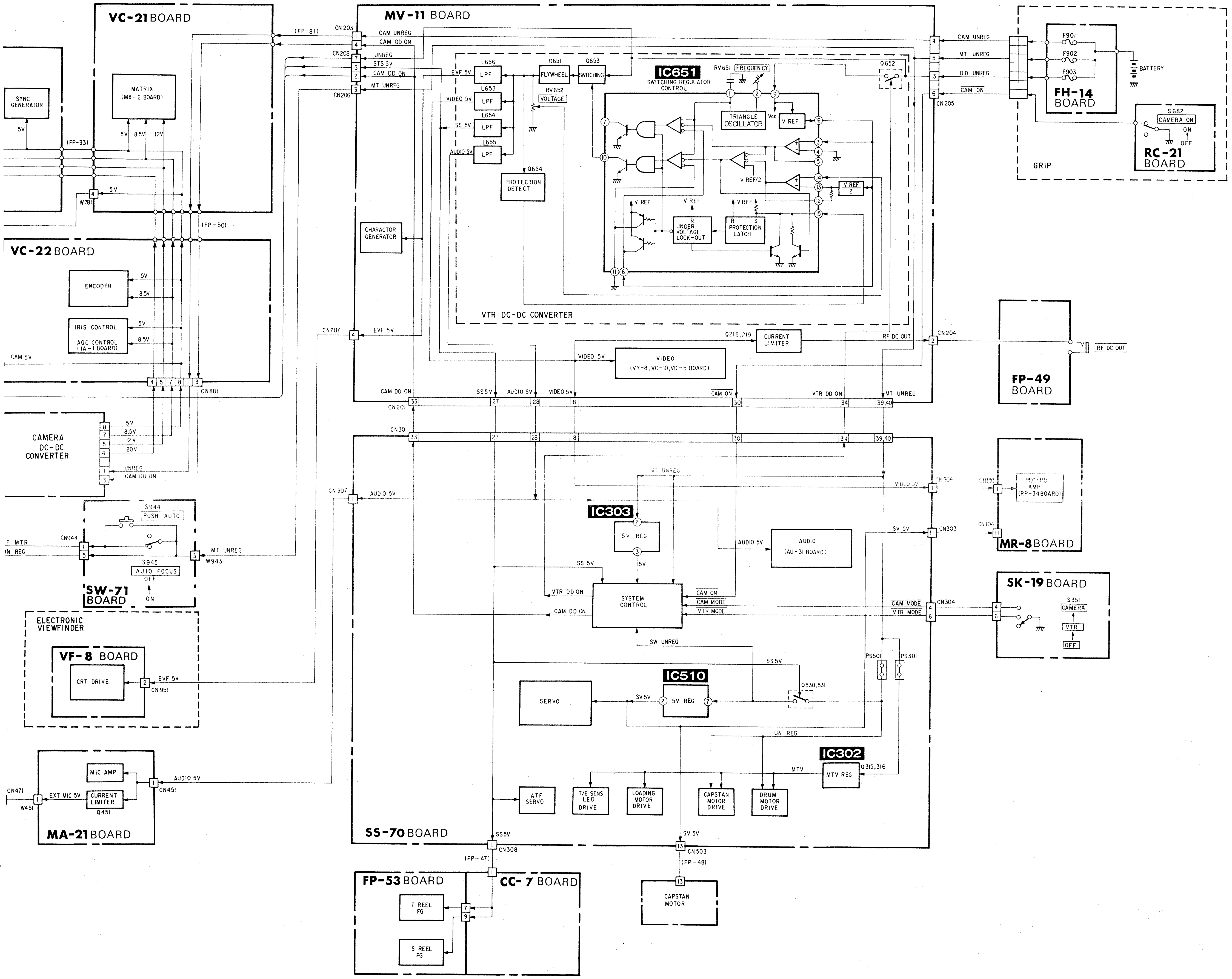
3-11. AUDIO BLOCK DIAGRAM


VIDEO BLOCK
DRUM
VIDEO HEAD
CH1
CH2
MR-8 BOARD
CN101
REC/PB AMP
CN103
PB RF(X)
REC RF(X)
CN306
SS-70 BOARD
CN301
CN201
MV-11 BOARD
REC Y RF
REC C RF
REC ATF
Y/C/AFM/ATF MIX
Q211–214
REC AFM(X)
RV201
REC AFM
AU-31 BOARD
FL401
1.5MHz BPF
Q403
RF AMP
REC AFM(X)
Q401.402
SP/LP SWITCH
RV401
CARRIER
RV402
DEVIATION
IC401
FM MOD/DEMOD
NOISE REDUCTION
MIC
REC/PB AUDIO
PB AMP
LIMITER
DROP OUT DETECTOR
Φ COMP (FM DEMOD)
HOLD 1
LIMITER
MOA
REC
PB
WEIGHTING FILTER
AGC AMP
AGC DET
MUTE
DET
DO
PB
REC
V/I CONV
EMPH-ASIS-2
VCO (FM MOD)
VCA
EMPH-ASIS-1
LPF
HOLD 2
MUTE DET
MUTE
PB
REC
PB
BUFFER
5dB AMP
PG DOUBLER
LPF
Q406
AUDIO MUTE

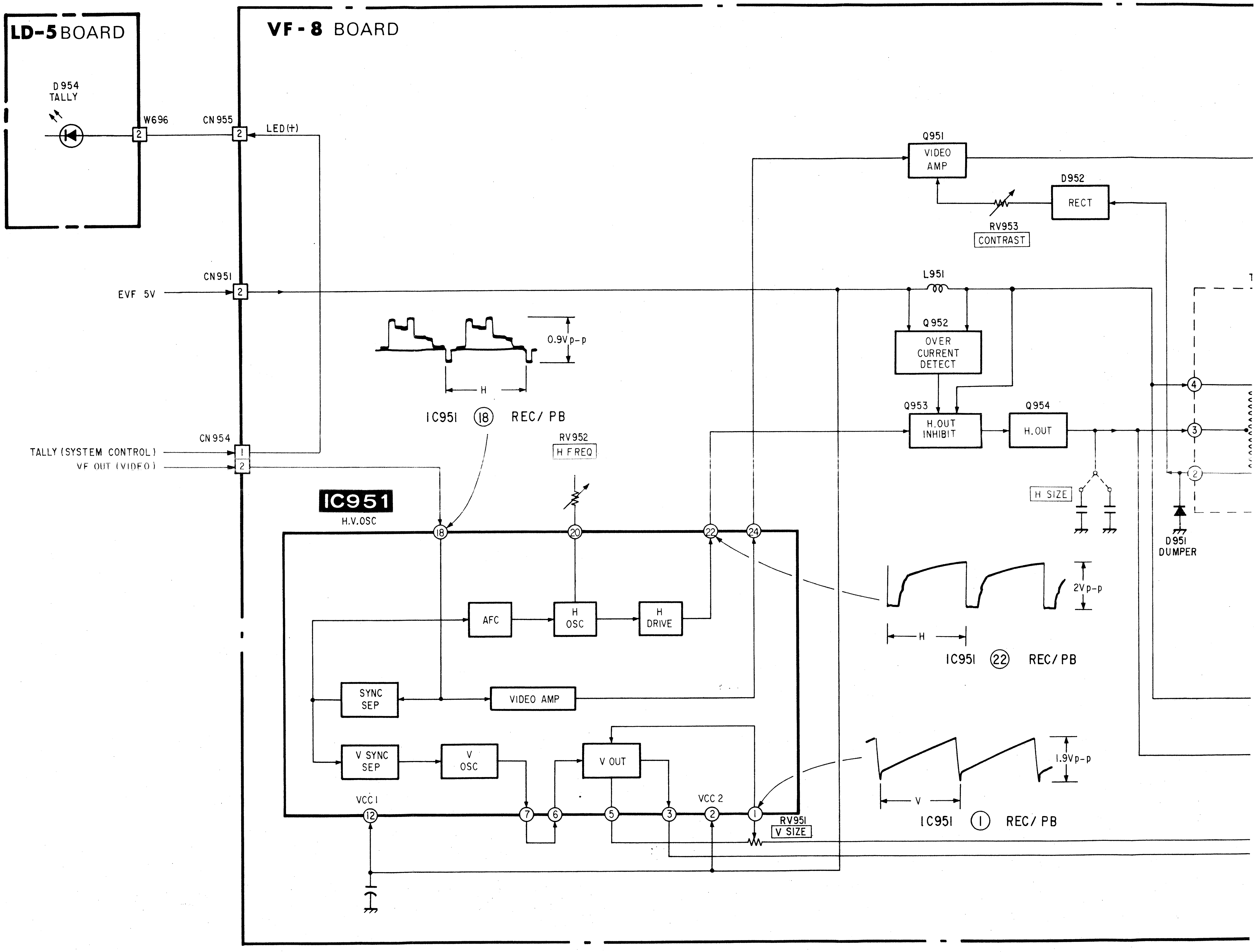

AU-31 BOARD
Q401,402
SP/LP SWITCH
RV401
CARRIER
RV402
DEVIATION
IC401
FM MOD/DEMOD NOISE REDUCTION
46
45
44
42
38
MIC
FL401
1.5MHz BPF
Q403
RF AMP
26
2
PB AMP
LIMITER
DROP OUT DETECTOR
Φ COMP (FM DEMOD)
HOLD 1
DO
PB
REC
MUTE
V/I CONV
VCO / FM MOD
LPF
HOLD 2
MUTE DET
PG DOUBLER
7
8
11
PB
12
13
15
16
17
23
LIMITER
REC
PB
AGC AMP
AGC DET
MUTE
BUFFER
5dB AMP
MOA
36
35
34
31
30
27
25
26
REC/PB AUDIO
WEIGHTING FILTER
DET
EMPH-ASIS-2
VCA
EMPH-ASIS-1
CN301
6
29
REC AFM (X)
LPF
Q406
AUDIO MUTE
Q404,405
LINE AMP
33
39
MIC IN
30
31
28
27
SP/LP
A MUTE
VA.PB MODE
SYSTEM CONTROL (SS-70 BOARD)
RF SWP (SERVO)
AUDIO 5V
CN307
CN451
AUDIO 5V
MIC IN
MA-21 BOARD
AUDIO 5V
Q451
CURRENT LIMITER
IC451 (1/2)
3/5
3
MIC 3V
1
IC451 (1/2)
7
MIC AMP
5
W451
CN471
EXT MIC 5V
MIC 3.3k
MIC 6.8k
MJ-12 BOARD
J472
DC OUT
J471
MIC
MIC UNIT
MV-11 BOARD
FP-49 BOARD
CN301
AUDIO OUT
CN201
CN204
6
AUDIO OUT

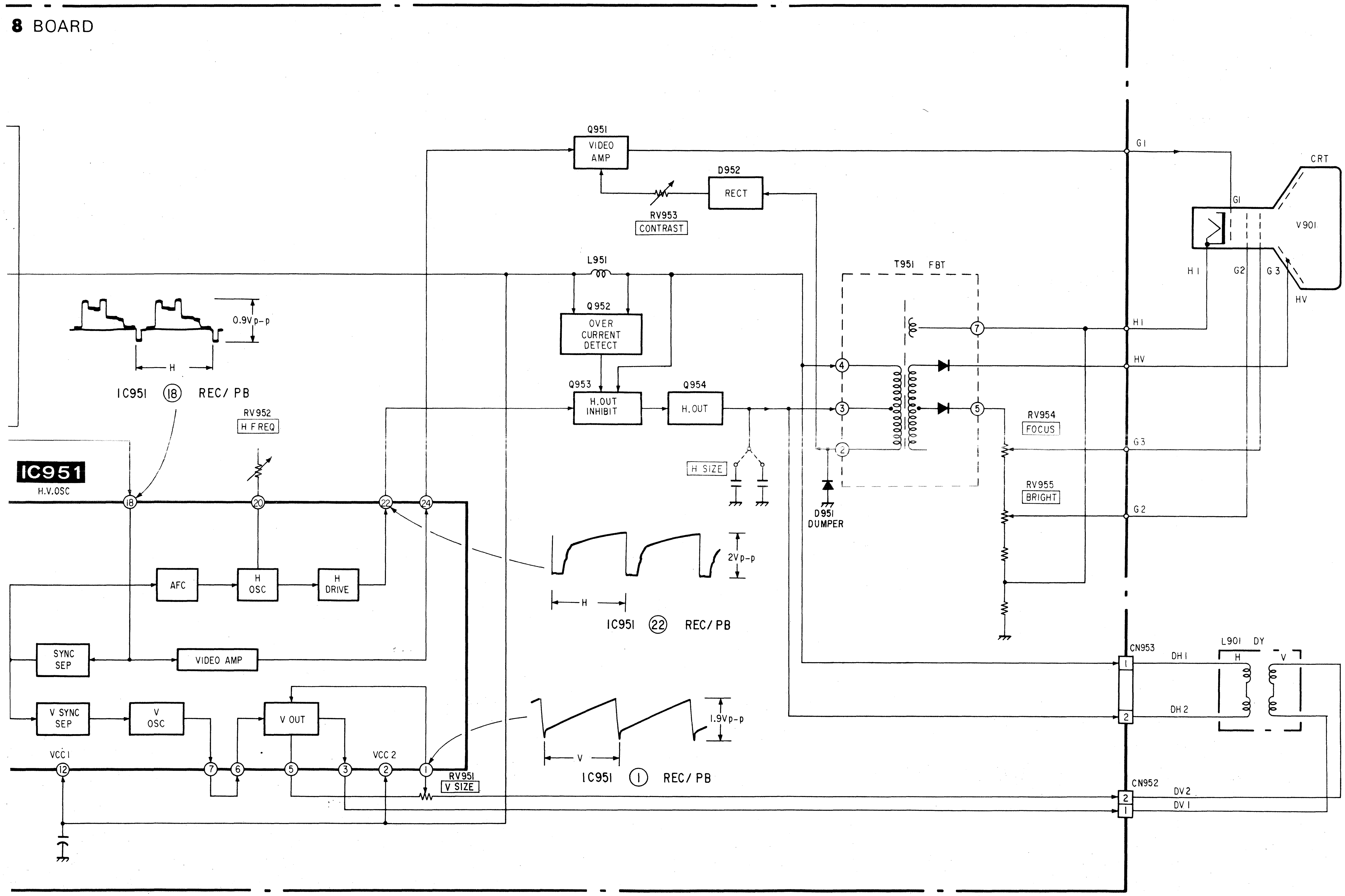
3-12. POWER BLOCK DIAGRAM


VC-20 BOARD
CCD IMAGER
TIMING GENERATOR (DT-61 BOARD)
PROCESS (SH-2 BOARD)
SYNC GENERATOR
VC-21 BOARD
MATRIX (MX-2 BOARD)
VC-22 BOARD
ENCODER
IRIS CONTROL
AGC CONTROL (IA-1 BOARD)
AW-9 BOARD
AUTO WHITE BALANCE
CAMERA DC-DC CONVERTER
AF-32 BOARD
AUTO FOCUS
SW-71 BOARD
S944 PUSH AUTO
S945 AUTO FOCUS
OFF
ON
ELECTRONIC VIEWFINDER
VF-8 BOARD
CRT DRIVE
MJ-12 BOARD
J472 MIC DC OUT
MA-21 BOARD
MIC AMP
CURRENT LIMITER
Q451
DS-24 BOARD
CHARACTOR MIX
DDS/DT PROCESS
IC111
DT 5V DETECT
Q116
DDS/DT CONTROL
Q115,128
TITLE MEMORY
LI-3 BOARD
LITHIUM BATTERY
RZ-1 BOARD
IC109
5V REG
Q118,119
ZOOM MOTOR DRIVE
IC110
Q120,121
MV-11 BOARD
CAM UNREG
CAM DD ON
UNREG
STS 5V
MT UNREG
EVF 5V
VIDEO 5V
SS 5V
AUDIO 5V
LPF
L653
L654
L655
L656
D651
Q653
FLYWHEEL
SWITCHING
RV652 VOLTAGE
Q654
PROTECTION DETECT
IC651
SWITCHING REGULATOR CONTROL
RV651 FREQUENCY
TRIANGLE OSCILLATOR
V REF
V REF/2
UNDER VOLTAGE LOCK-OUT
PROTECTION LATCH
Q652
VTR DC-DC CONVERTER
CHARACTOR GENERATOR
Q218,219
CURRENT LIMITER
RF DC OUT
VIDEO (VY-8, VC-10, VD-5 BOARD)
CAM ON
VTR DD ON
SS-70 BOARD
IC303
5V REG
AUDIO (AU-31 BOARD)
SYSTEM CONTROL
CAM MODE
VTR MODE
SW UNREG
IC510
SERVO
Q530,531
PS501
PS301
UN REG
IC302
MTV REG
Q315,316
ATF SERVO
T/E SENS LED DRIVE
LOADING MOTOR DRIVE
CAPSTAN MOTOR DRIVE
DRUM MOTOR DRIVE
FP-53 BOARD
T REEL FG
S REEL FG
CC-7 BOARD
CAPSTAN MOTOR
DD UNREG
MR-
SK
FP
BO


VC-21 BOARD
SYNC GENERATOR
MATRIX (MX-2 BOARD)
5V
8.5V
12V
(FP-33)
(FP-81)
(FP-80)
W781
VC-22 BOARD
ENCODER
IRIS CONTROL
AGC CONTROL (IA-1 BOARD)
CAM 5V
CN881
CAMERA DC-DC CONVERTER
20V
UNREG
CAM DD ON
SW-71 BOARD
S944 PUSH AUTO
S945 AUTO FOCUS
OFF
ON
CN944
W943
MT UNREG
ELECTRONIC VIEWFINDER
VF-8 BOARD
CRT DRIVE
EVF 5V
CN951
MA-21 BOARD
MIC AMP
CURRENT LIMITER
Q451
EXT MIC 5V
CN471
W451
CN451
AUDIO 5V
MV-11 BOARD
CN203
CN208
CN206
CN207
CAM UNREG
CAM DD ON
STS 5V
MT UNREG
L656
L653
L654
L655
LPF
EVF 5V
VIDEO 5V
SS 5V
AUDIO 5V
D651 FLYWHEEL
Q653 SWITCHING
RV652 VOLTAGE
Q654
PROTECTION DETECT
IC651
SWITCHING REGULATOR CONTROL
RV651 FREQUENCY
Q652
TRIANGLE OSCILLATOR
V REF
V REF/2
UNDER VOLTAGE LOCK-OUT
PROTECTION LATCH
VTR DC-DC CONVERTER
CHARACTER GENERATOR
Q218,219
CURRENT LIMITER
RF DC OUT
VIDEO (VY-8, VC-10, VD-5 BOARD)
CAM ON
VTR DD ON
CN201
CN204
CN205
DD UNREG
GRIP
FH-14 BOARD
F901
F902
F903
BATTERY
RC-21 BOARD
S682 CAMERA ON
FP-49 BOARD
CN301
SS-70 BOARD
CN307
IC303
5V REG
AUDIO (AU-31 BOARD)
SYSTEM CONTROL
CAM MODE
VTR MODE
SW UNREG
IC510
SERVO
SV 5V
Q530,531
PS501
PS301
UN REG
IC302
MTV REG
MTV
Q315,316
ATF SERVO
T/E SENS LED DRIVE
LOADING MOTOR DRIVE
CAPSTAN MOTOR DRIVE
DRUM MOTOR DRIVE
CN308
CN503
CN306
CN303
CN304
MR-8 BOARD
REC/PB AMP (RP-34 BOARD)
CN101
CN104
SK-19 BOARD
S351
CAMERA
VTR
(FP-47)
(FP-48)
FP-53 BOARD
T REEL FG
S REEL FG
CC-7 BOARD
CAPSTAN MOTOR

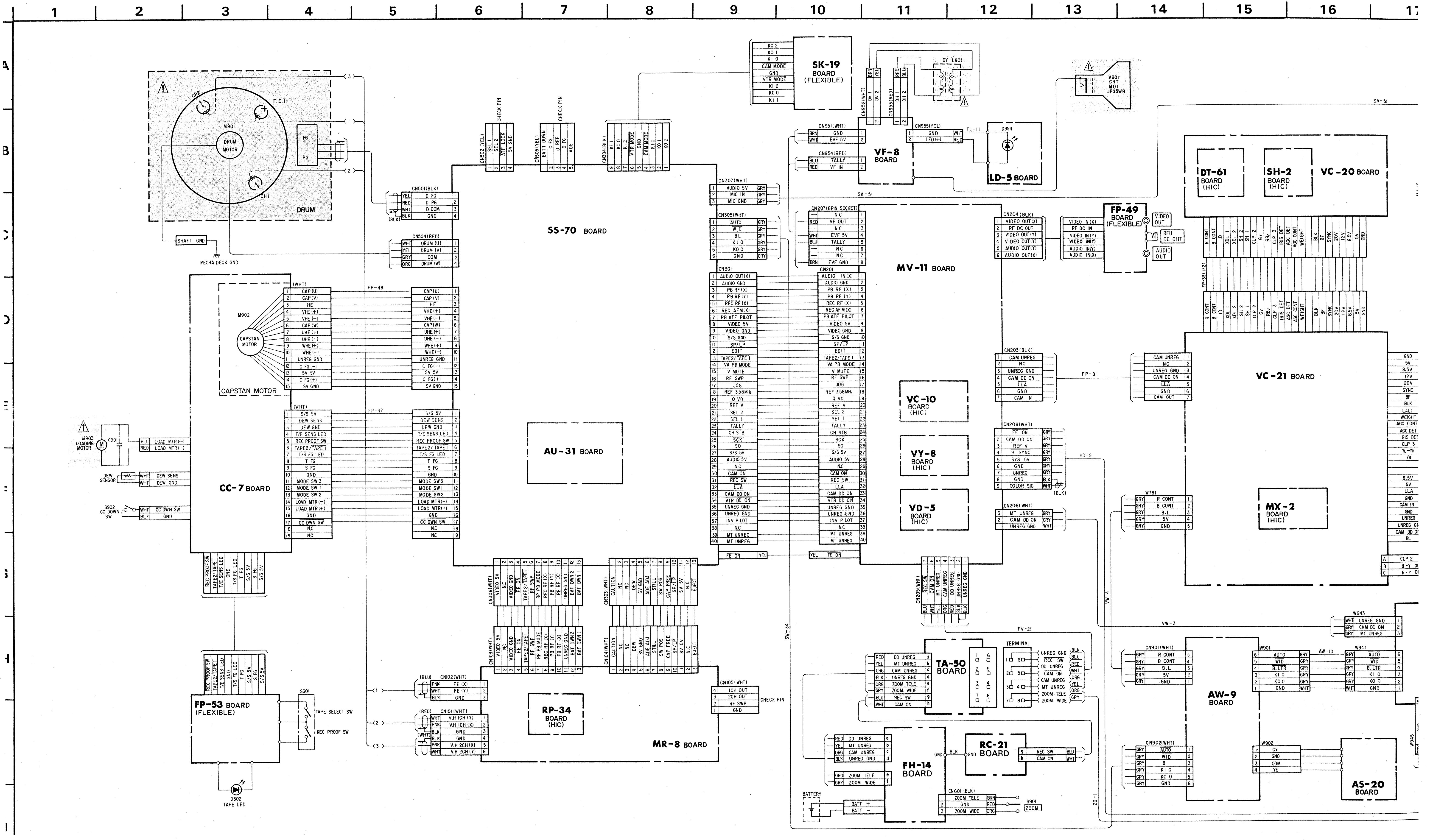
3-13. VIEWFINDER BLOCK DIAGRAM


LD-5 BOARD
D954
TALLY
W696
CN955
LED(+)
VF-8 BOARD
CN951
EVF 5V
CN954
TALLY (SYSTEM CONTROL)
VF OUT (VIDEO)
0.9Vp-p
H
IC951 (18) REC/PB
RV952
H FREQ
IC951
H.V.OSC
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP
V SYNC SEP
V OSC
V OUT
VCC 1
VCC 2
RV951
V SIZE
Q951
VIDEO AMP
D952
RECT
RV953
CONTRAST
L951
Q952
OVER CURRENT DETECT
Q953
H.OUT INHIBIT
Q954
H.OUT
H SIZE
D951
DUMPER
2Vp-p
H
IC951 (22) REC/PB
1.9Vp-p
V
IC951 (1) REC/PB


8 BOARD
Q951
VIDEO AMP
D952
RECT
RV953
CONTRAST
L951
Q952
OVER CURRENT DETECT
Q953
H.OUT INHIBIT
Q954
H.OUT
H SIZE
T951 FBT
D951 DUMPER
RV954
FOCUS
RV955
BRIGHT
G1
H1
HV
G3
G2
CRT
V901
CN953
DH1
DH2
L901 DY
H
V
CN952
DV2
DV1
0.9Vp-p
H
IC951 ⑱ REC/PB
RV952
H FREQ
IC951
H.V.OSC
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP
V SYNC SEP
V OSC
V OUT
VCC1
VCC2
RV951
V SIZE
2Vp-p
IC951 ㉒ REC/PB
1.9Vp-p
IC951 ① REC/PB

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

4-1. FRAME SCHEMATIC DIAGRAM


1
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7
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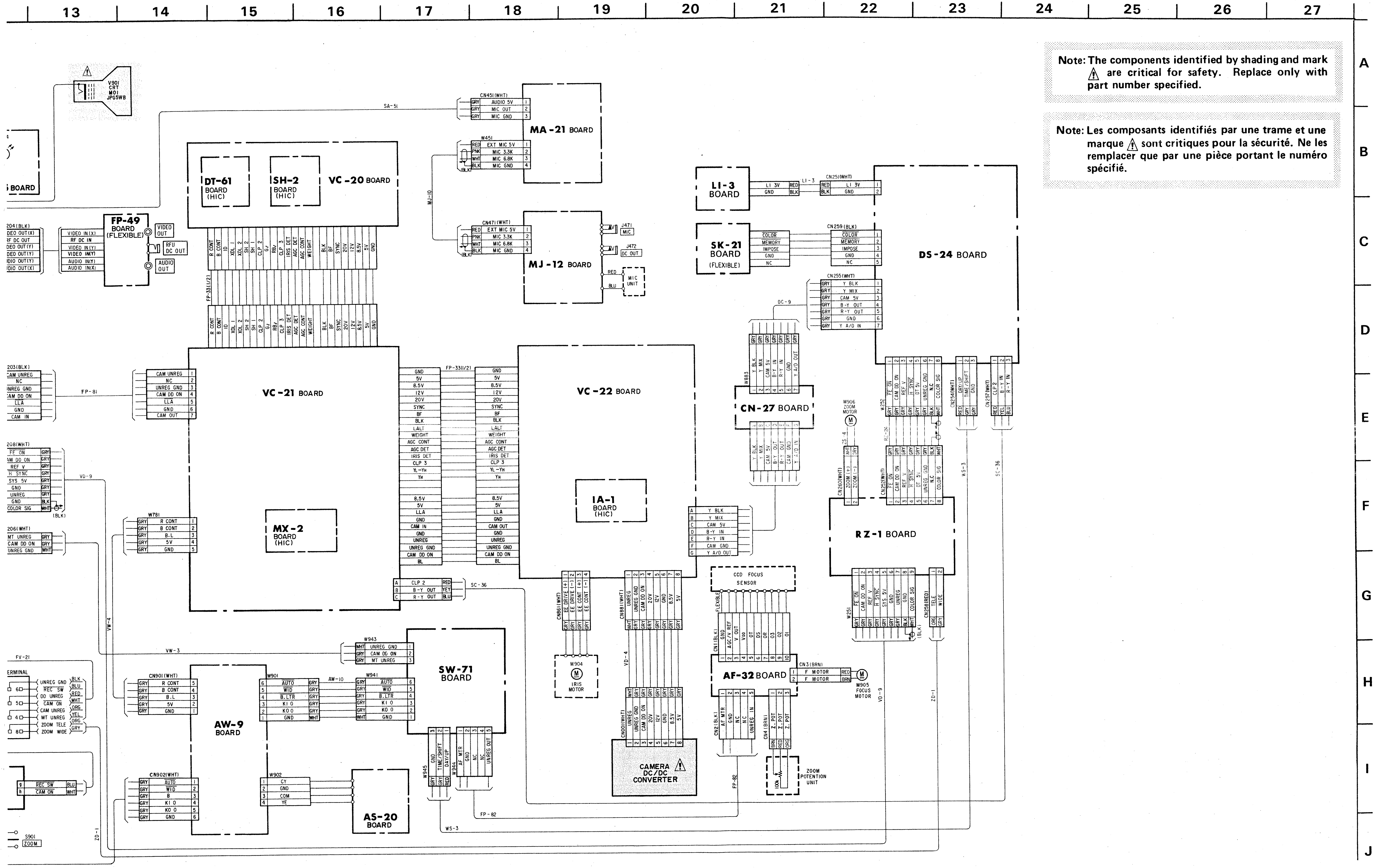
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
DRUM
M901
DRUM MOTOR
F.E.H
CH1
CH2
FG
PG
SHAFT GND
MECHA DECK GND
CN501(BLK)
D FG
D PG
D COM
GND
CN504(RED)
DRUM (U)
DRUM (V)
COM
DRUM (W)
CN502(YEL)
CHECK PIN
CN505(YEL)
CN304(BLK)
SS-70 BOARD
SK-19 BOARD (FLEXIBLE)
VF-8 BOARD
LD-5 BOARD
D954
DY L901
V901 CRT M01 JPG5WB
SA-51
CN307(WHT)
AUDIO 5V
MIC IN
MIC GND
CN305(WHT)
CN301
CN201
CN207(8PIN SOCKET)
MV-11 BOARD
CN204(BLK)
FP-49 BOARD (FLEXIBLE)
VIDEO OUT
RFU DC OUT
AUDIO OUT
DT-61 BOARD (HIC)
SH-2 BOARD (HIC)
VC-20 BOARD
FP-33(1/2)
VC-21 BOARD
MX-2 BOARD (HIC)
CN203(BLK)
CN208(WHT)
CN206(WHT)
FP-81
VD-9
VC-10 BOARD (HIC)
VY-8 BOARD (HIC)
VD-5 BOARD (HIC)
M902
CAPSTAN MOTOR
FP-48
FP-47
CC-7 BOARD
M903 LOADING MOTOR
C901
DEW SENSOR
S902 CC DOWN SW
AU-31 BOARD
CN306(WHT)
CN303(WHT)
CN103(WHT)
CN104(WHT)
FP-53 BOARD (FLEXIBLE)
S301
TAPE SELECT SW
REC PROOF SW
D302 TAPE LED
CN102(WHT)
CN101(WHT)
CN105(WHT)
RP-34 BOARD (HIC)
MR-8 BOARD
CN205(WHT)
SW-34
VW-4
VW-3
FV-21
TA-50 BOARD
TERMINAL
FH-14 BOARD
RC-21 BOARD
CN601(BLK)
S901 ZOOM
BATTERY
BATT +
BATT −
ZD-1
W781
CN901(WHT)
CN902(WHT)
W901
W902
AW-10
W941
W943
W945
AW-9 BOARD
AS-20 BOARD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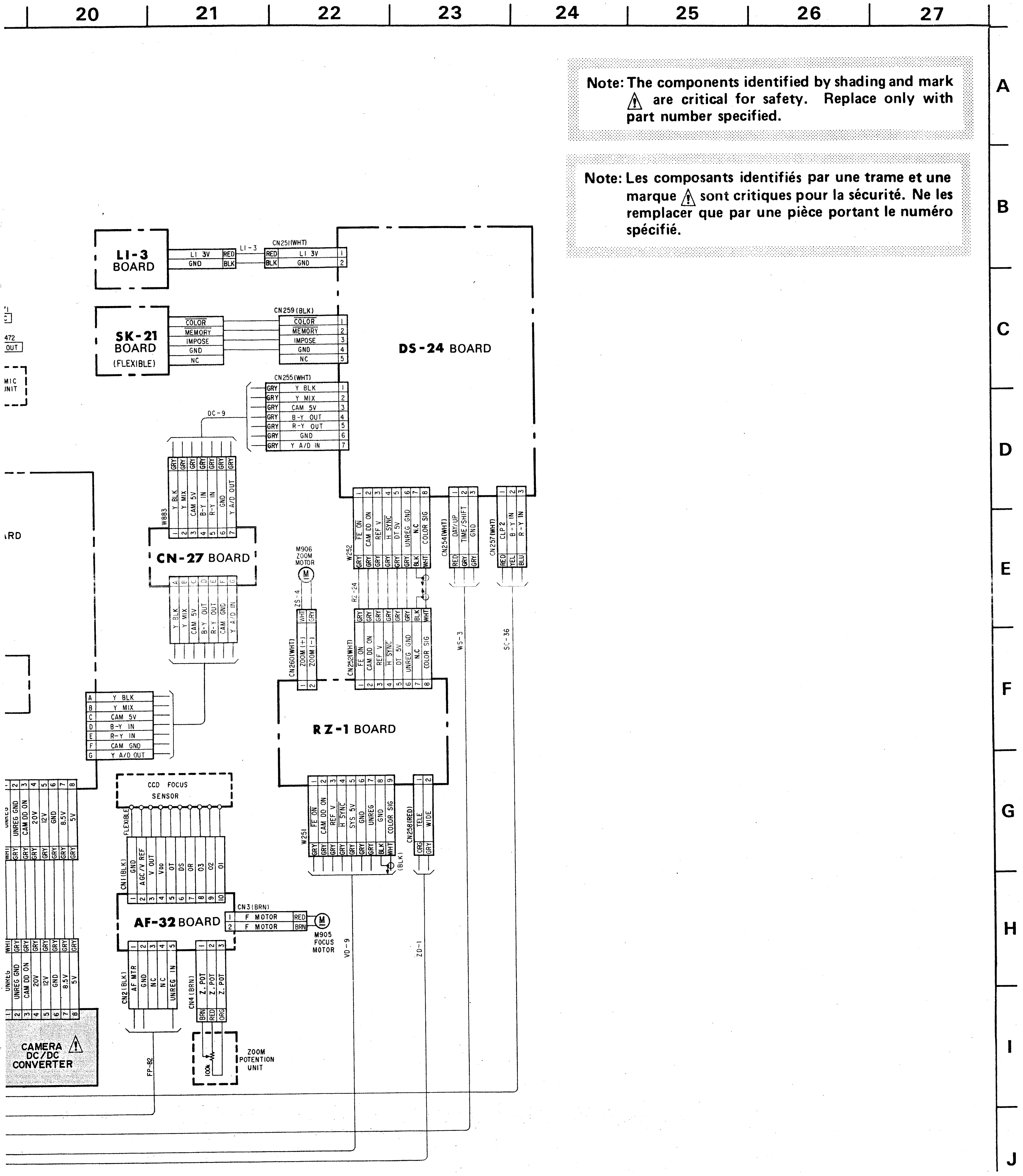
A
B
C
D
E
F
G
H
I
J
V901 CRT M01 JPG5WB
FP-49 BOARD (FLEXIBLE)
VIDEO OUT
RFU DC OUT
AUDIO OUT
DT-61 BOARD (HIC)
SH-2 BOARD (HIC)
VC-20 BOARD
FP-33(1/2)
VC-21 BOARD
MX-2 BOARD (HIC)
MA-21 BOARD
MJ-12 BOARD
MIC UNIT
J471 MIC
J472 DC OUT
VC-22 BOARD
IA-1 BOARD (HIC)
LI-3 BOARD
SK-21 BOARD (FLEXIBLE)
DS-24 BOARD
CN-27 BOARD
RZ-1 BOARD
M906 ZOOM MOTOR
M904 IRIS MOTOR
CAMERA DC/DC CONVERTER
CCD FOCUS SENSOR
AF-32 BOARD
M905 FOCUS MOTOR
ZOOM POTENTION UNIT
SW-71 BOARD
AW-9 BOARD
AS-20 BOARD
FV-21
S901 ZOOM
SA-51
MJ-10
FP-81
VD-9
VW-4
VW-3
AW-10
SC-36
VD-4
FP-82
WS-3
ZD-1
DC-9

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

PRECAUTIONS
IMAGER BLO

- With a pair
plate board
complete bo
imager block.
Since correc
CCD imager,
imager corre
- When both
replace both
when a corre
set, install a


20
21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
LI-3 BOARD
LI 3V
GND
RED
BLK
LI-3
CN251(WHT)
SK-21 BOARD (FLEXIBLE)
CN259(BLK)
COLOR
MEMORY
IMPOSE
GND
NC
DS-24 BOARD
CN255(WHT)
Y BLK
Y MIX
CAM 5V
B-Y OUT
R-Y OUT
Y A/D IN
DC-9
W883
CN-27 BOARD
M906 ZOOM MOTOR
ZS-4
CN260(WHT)
ZOOM (+)
ZOOM (-)
W252
RZ-24
CN252(WHT)
FE ON
CAM DD ON
REF V
H SYNC
DT 5V
UNREG GND
N.C
COLOR SIG
CN254(WHT)
DAY/UP
TIME/SHIFT
CN257(WHT)
CLP 2
B-Y IN
R-Y IN
WS-3
SC-36
RZ-1 BOARD
W251
SYS 5V
UNREG
CN258(RED)
TELE
WIDE
CCD FOCUS SENSOR
FLEXIBLE
CN11(BLK)
AGC/V REF
V OUT
AF-32 BOARD
CN3(BRN)
F MOTOR
M905 FOCUS MOTOR
VD-9
ZD-1
CN21(BLK)
AF MTR
UNREG IN
CN4(BRN)
Z. POT
ZOOM POTENTION UNIT
FP-82
UNREG GND
CAM DD ON
20V
12V
8.5V
5V
CAMERA DC/DC CONVERTER

Note: **The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

Note: **Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.**

PRECAUTIONS FOR REPLACEMENT OF CCD IMAGER BLOCK

- With a pair of IC701 (CCD imager) on the VC-20 complate board and IC002 (corrector ROM) on the DT-61 complete board, it is used a repair part of the CCD imager block.
  Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC701 (CCD imager) is not mounted on the VC-20 complete board to be supplied as a repair part, and IC002 (corrector ROM) is not mounted on the DT-61 complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new ones respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity. For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

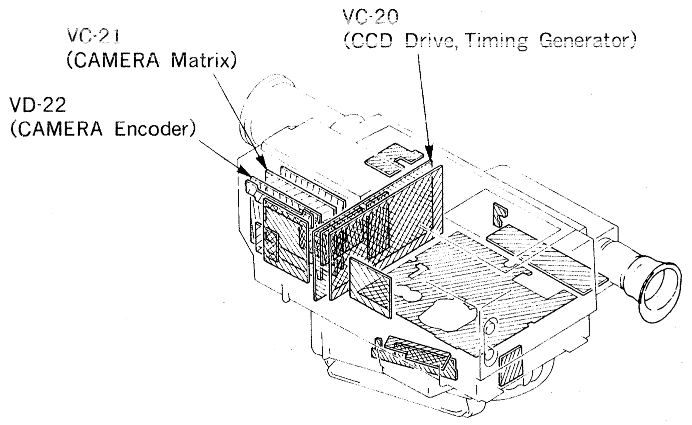
Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.
- **Digital transistor (VC-22: Q861) transistor with resistor.**
- **Refer to the VC-22 board schematic diagram for digital transistor.**

Caution:

Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

When indicating parts by reference number, please include the board name.

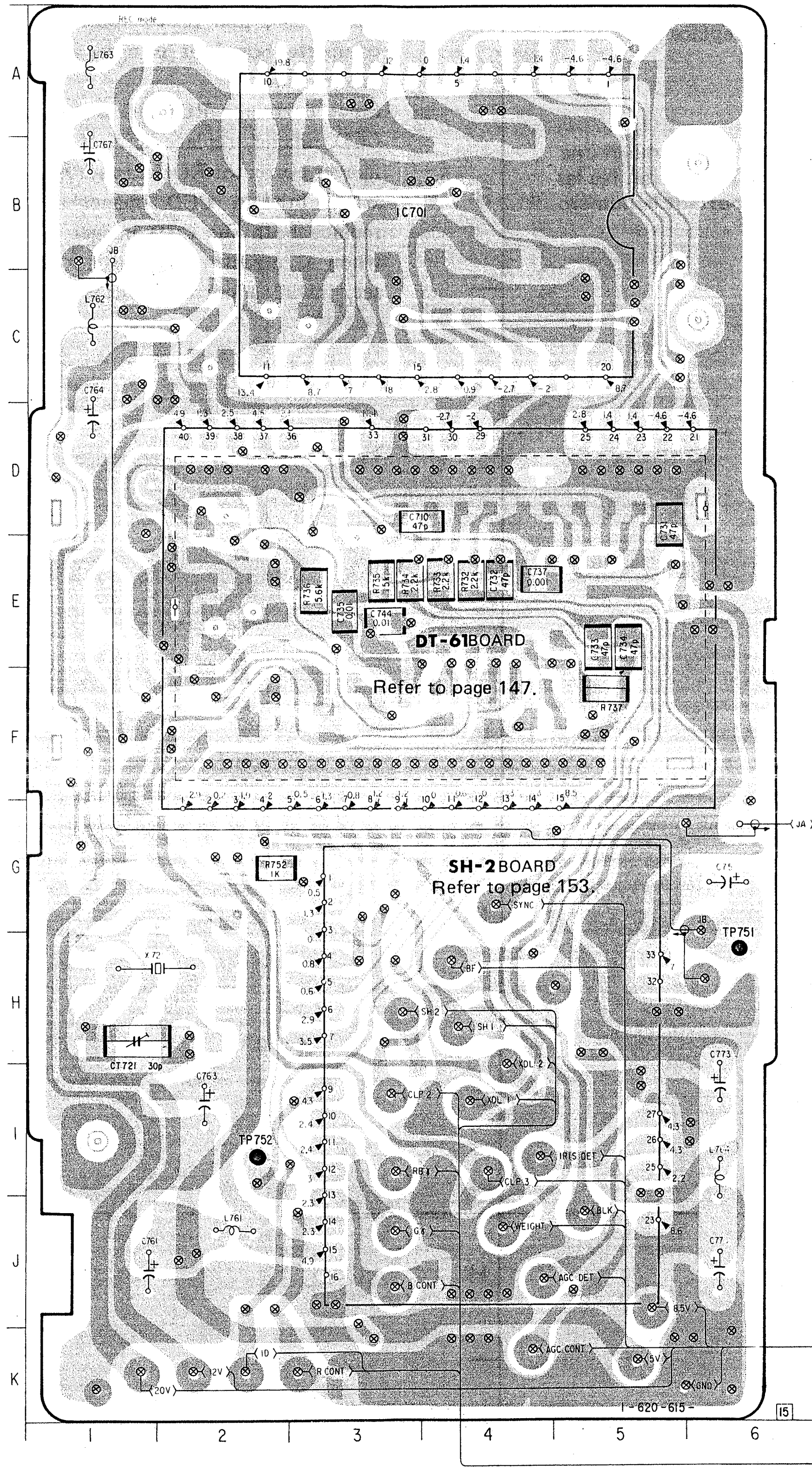

VC-21
(CAMERA Matrix)
VC-20
(CCD Drive, Timing Generator)
VD-22
(CAMERA Encoder)

CT721	H-1
D701	C-11
IC701	B-4
IC731	E-9
Q701	C-11
Q721	G-11
Q722	G-12
Q731	D-11
TP751	H-6
TP752	I-2
TP753	K-6
TP754	K-1

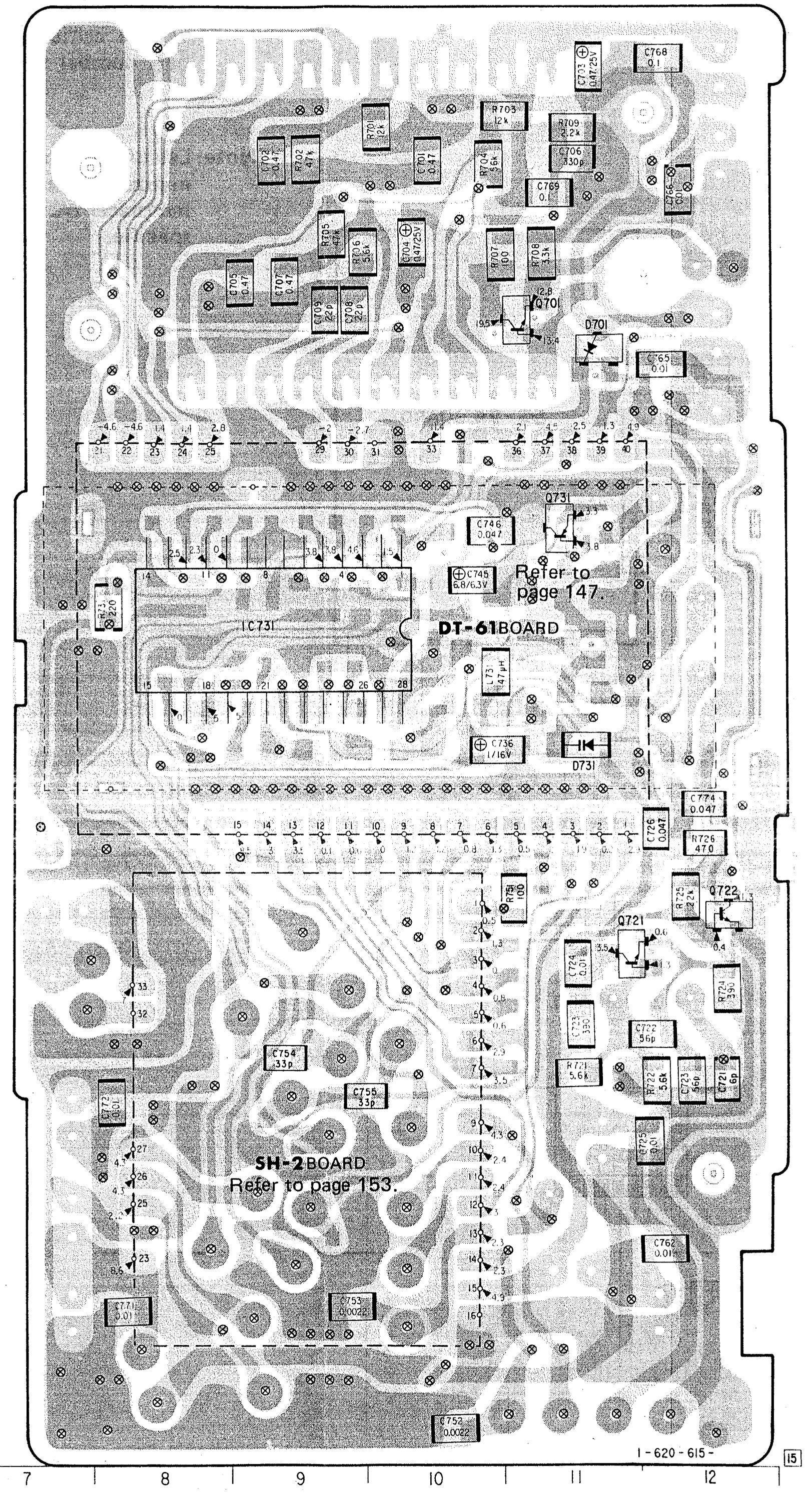
VC-20(CCD DRIVE, TIMING GENERATOR), VC-21(CAMERA MATRIX), VC-22(CAMERA ENCODER)PRINTED WIRING BOARDS

—Ref. No. VC-20, VC-21 and VC-22 BOARDS : 1, 000 series—

VC-20 BOARD (COMPONENT SIDE)

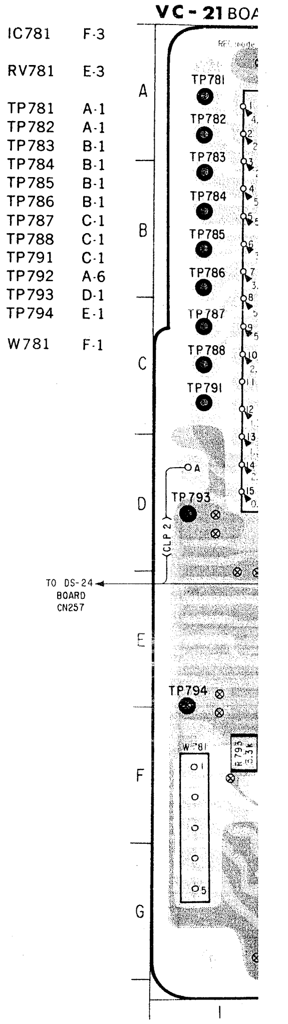

A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
IC701
DT-61BOARD
Refer to page 147.
SH-2BOARD
Refer to page 153.
TP751
TP752
CT721 30p
R752 1K
R737
(SYNC)
(SH 1)
(SH 2)
(CLP 2)
(CLP 1)
(IRIS DET)
(BLK)
(WEIGHT)
(B CONT)
(AGC DET)
(AGC CONT)
(R CONT)
(5V)
(GND)
(20V)
(12V)
1-620-615-
15

VC-20 BOARD (SOLDER SIDE)

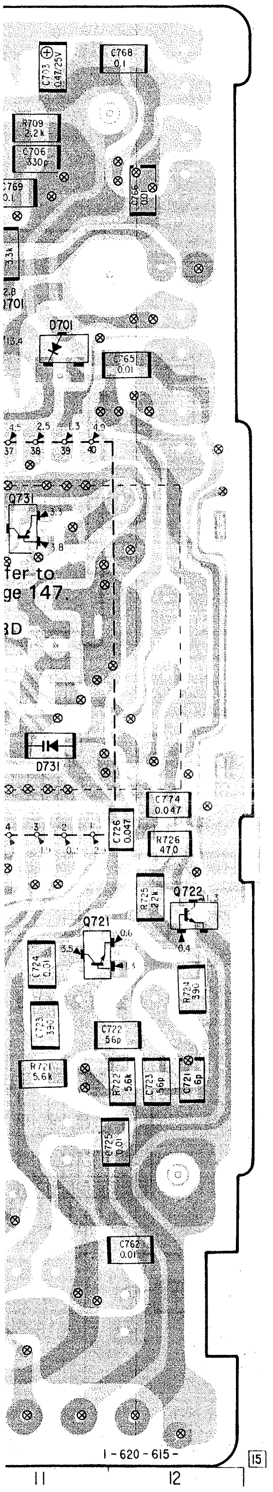

7
8
9
10
11
12
IC731
DT-61BOARD
Refer to page 147.
SH-2BOARD
Refer to page 153.
Q701
D701
Q731
Q721
Q722
D731
C768 0.1
R703 12k
C706 330p
C746 0.047
C736 1/16V
C774 0.047
R726 470
C754 33p
C755 33p
C762 0.01
1-620-615-
15

IC781	F-3
RV781	E-3
TP781	A-1
TP782	A-1
TP783	B-1
TP784	B-1
TP785	B-1
TP786	B-1
TP787	C-1
TP788	C-1
TP791	C-1
TP792	A-6
TP793	D-1
TP794	E-1
W781	F-1

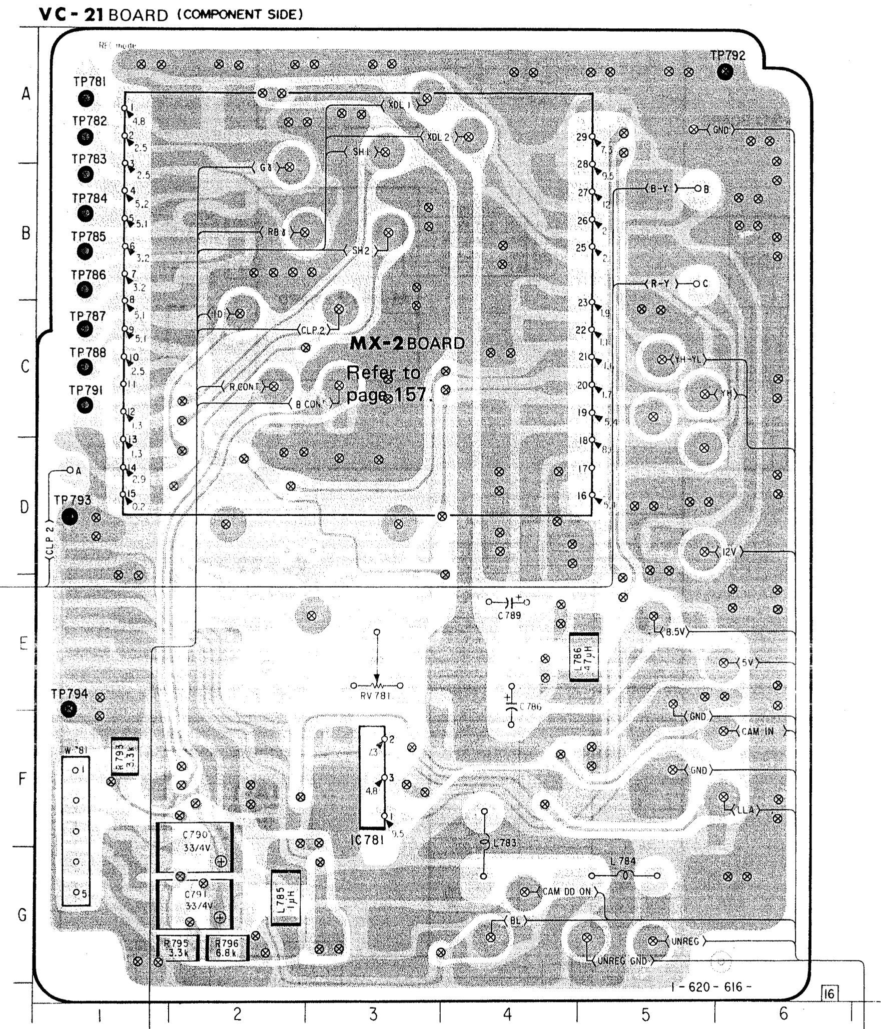
VC-21 BOA

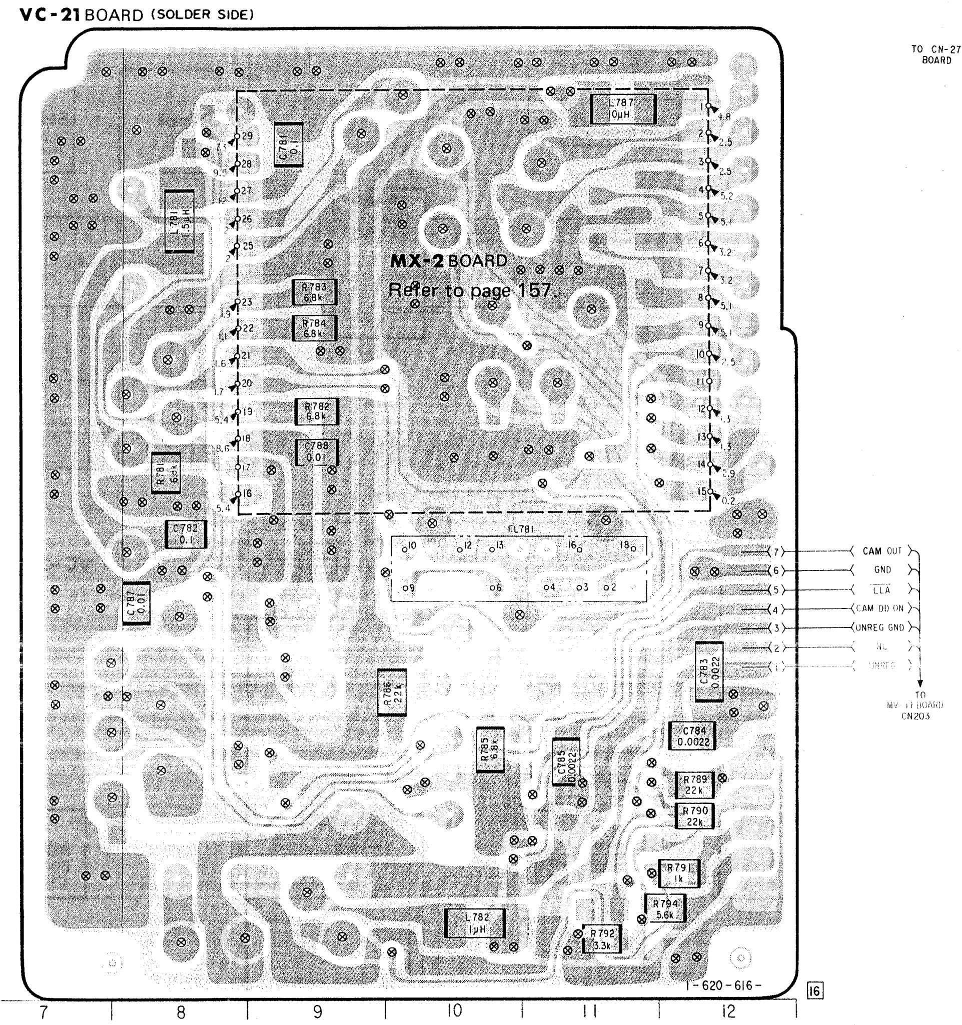

A
B
C
D
E
F
G
TP781
TP782
TP783
TP784
TP785
TP786
TP787
TP788
TP791
TP793
TP794
(CLP 2)
TO DS-24 BOARD CN257
W781

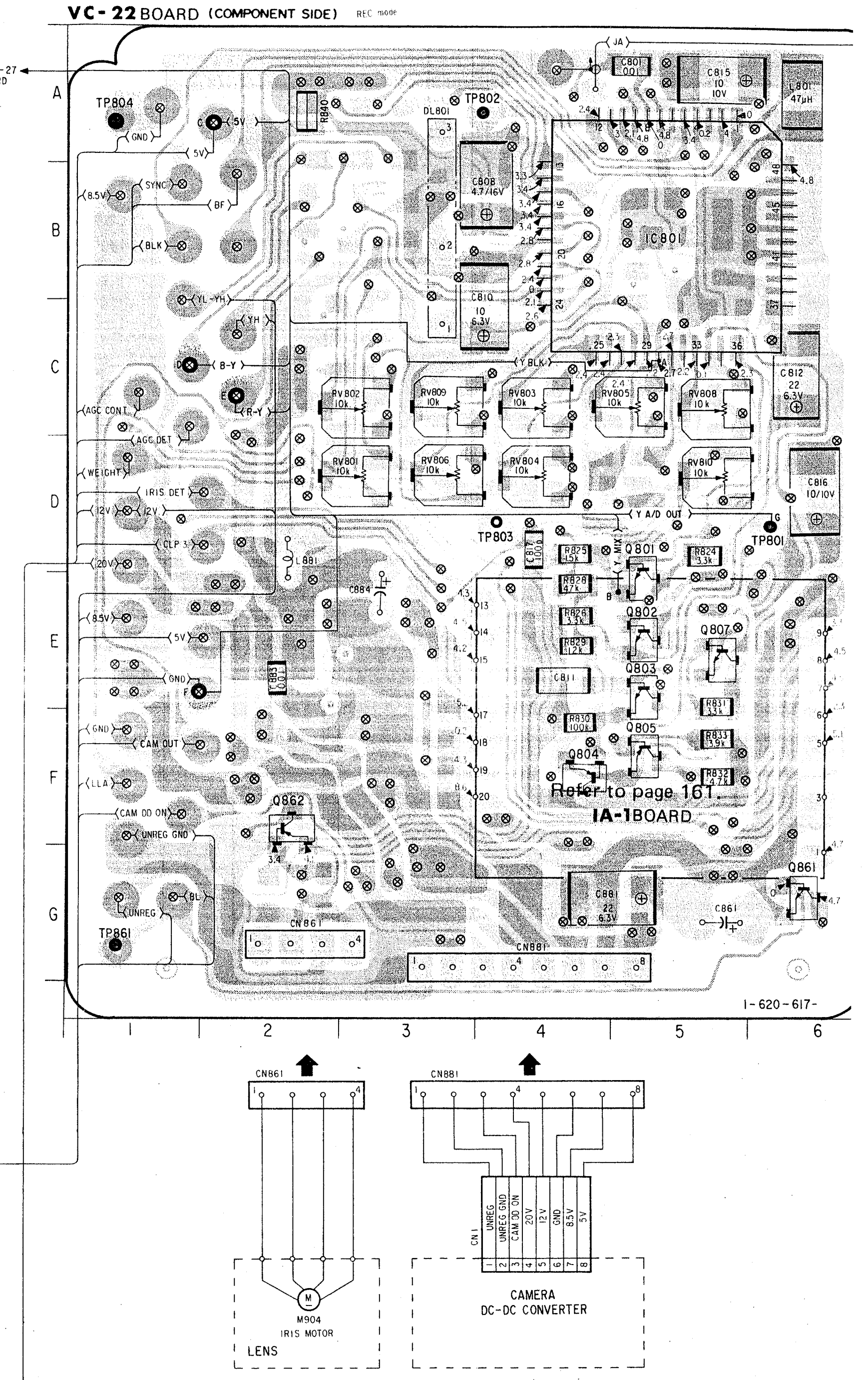
Be sure to always read "Note on replacing the CCD imager block" in page 86 when replacing the VC-20 complete board. DT-61 complete board, and CCD imager block (IC701 on the VC-20 board and IC002 on the DT-61 board).


C768 0.1
R709 2.2k
C706 330p
C769
Q701
C765 0.01
Q73
Refer to page 147
D731
C774 0.047
R726 47Ω
Q722
Q721
C724
C722 56p
R721 5.6k
C762 0.01
1-620-615-
11
12
15

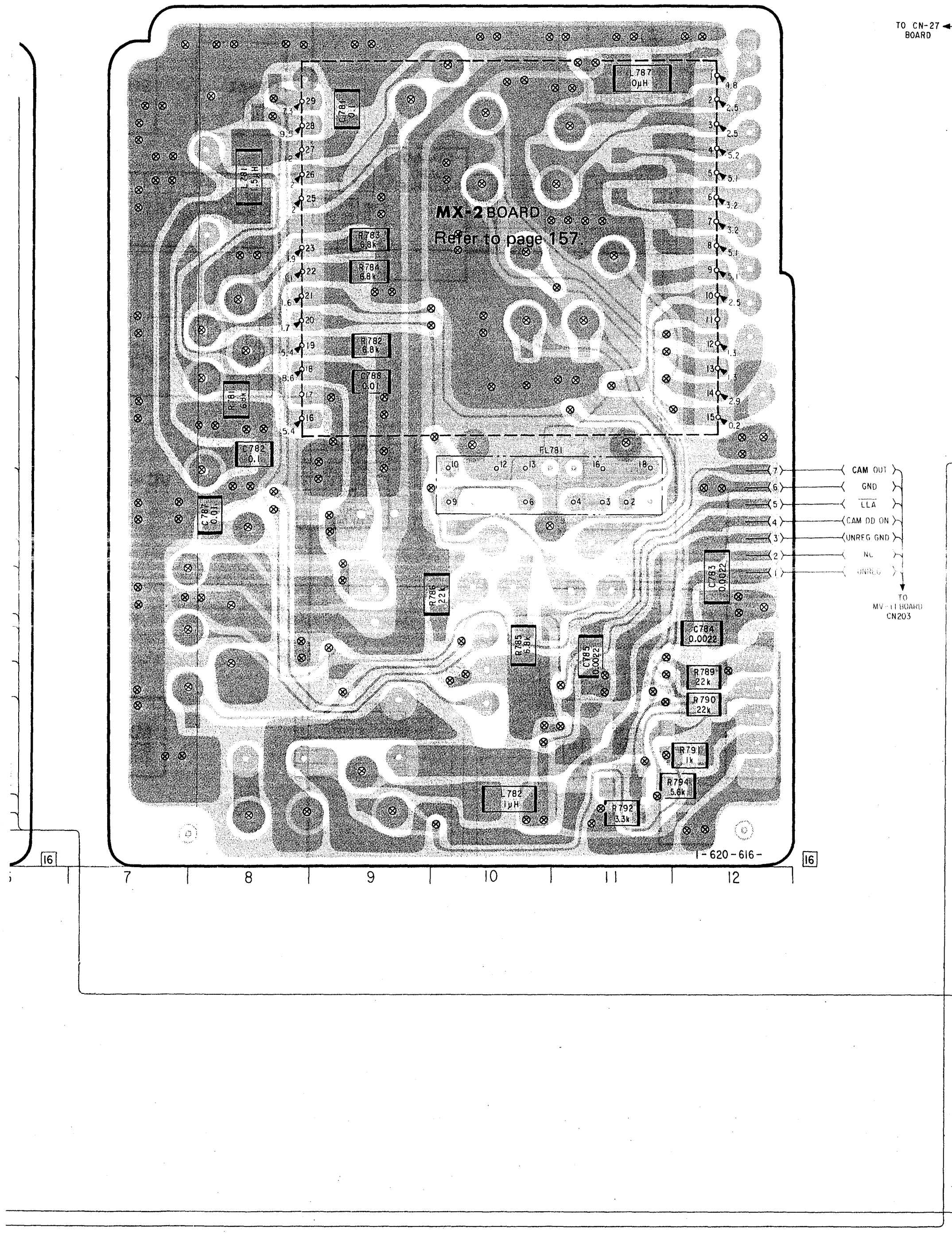
IC781	F-3
RV781	E-3
TP781	A-1
TP782	A-1
TP783	B-1
TP784	B-1
TP785	B-1
TP786	B-1
TP787	C-1
TP788	C-1
TP791	C-1
TP792	A-6
TP793	D-1
TP794	E-1
W781	F-1


VC-21 BOARD (COMPONENT SIDE)
TO DS-24 BOARD CN257
TP781
TP782
TP783
TP784
TP785
TP786
TP787
TP788
TP791
TP792
TP793
TP794
MX-2 BOARD
Refer to page 157.
XDL 1
XDL 2
SH1
SH2
G1
RBK
CLP 2
R CONT
B CONT
B-Y
R-Y
YH-YL
YH
GND
12V
8.5V
5V
CAM IN
LLA
CAM DD ON
BL
UNREG
UNREG GND
RV781
IC781
C789
C786
L786 4.7μH
C783
L784
C790 33/4V
C791 33/4V
L785 1μH
R795 3.3k
R796 6.8k
R793 3.3k
W781
1-620-616-
16
A
B
C
D
E
F
G
1
2
3
4
5
6

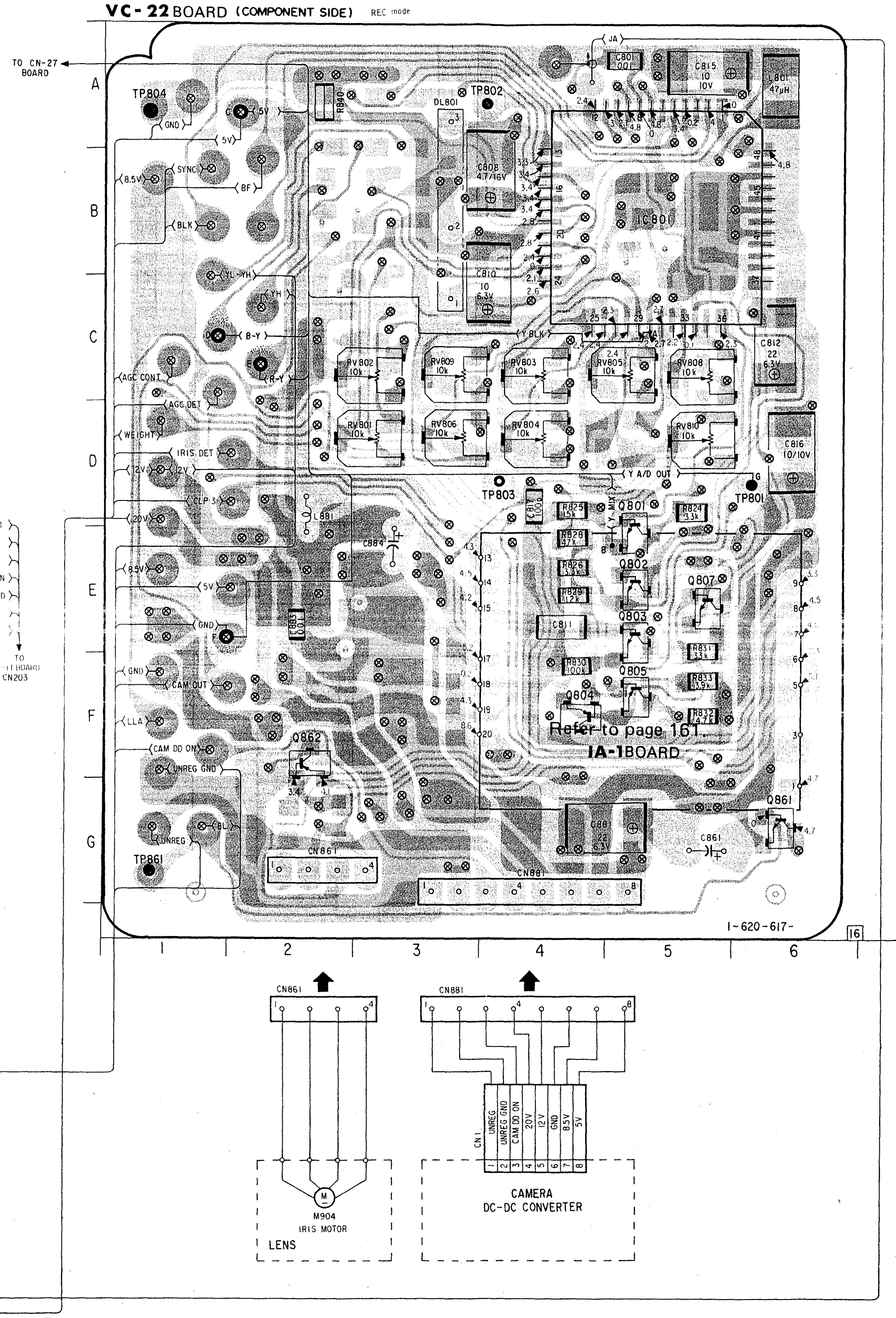

VC-21 BOARD (SOLDER SIDE)
MX-2 BOARD
Refer to page 157.
L787 10μH
C781
L781
R783 6.8k
R784 6.8k
R782 6.8k
C788 0.01
C782 0.01
C787 0.01
FL781
R786 22k
R785 6.8k
C785 0.0022
C784 0.0022
C793
R789 22k
R790 22k
R791 1k
C794 5.6k
L782 1μH
R792 3.3k
CAM OUT
GND
LLA
CAM DD ON
UNREG GND
TO MV-11 BOARD CN203
1-620-616-
16
7
8
9
10
11
12


VC-22 BOARD (COMPONENT SIDE)
TO CN-27 BOARD
TP804
TP802
TP803
TP801
TP861
DL801
C808 4.7/16V
C810 10 6.3V
IC801
C801 0.01
C815 10 10V
L801 47μH
C812 22 6.3V
C816 10/10V
RV802 10k
RV809 10k
RV803 10k
RV805 10k
RV808 10k
RV801 10k
RV806 10k
RV804 10k
RV810 10k
5V
8.5V
SYNC
BF
BLK
YL-YH
B-Y
YH
R-Y
AGC CONT
AGC DET
WEIGHT
IRIS DET
12V
CLP 1
20V
Y A/D OUT
GND
CAM OUT
LLA
CAM DD ON
UNREG GND
BL
UNREG
Q801
Q802
Q803
Q804
Q805
Q807
Q861
Q862
Refer to page 161.
IA-1BOARD
C881 22 6.3V
C861
CN861
CN881
M904 IRIS MOTOR
LENS
CAMERA DC-DC CONVERTER
UNREG
UNREG GND
CAM DD ON
20V
12V
GND
8.5V
5V
1-620-617-
A
B
C
D
E
F
G
1
2
3
4
5
6

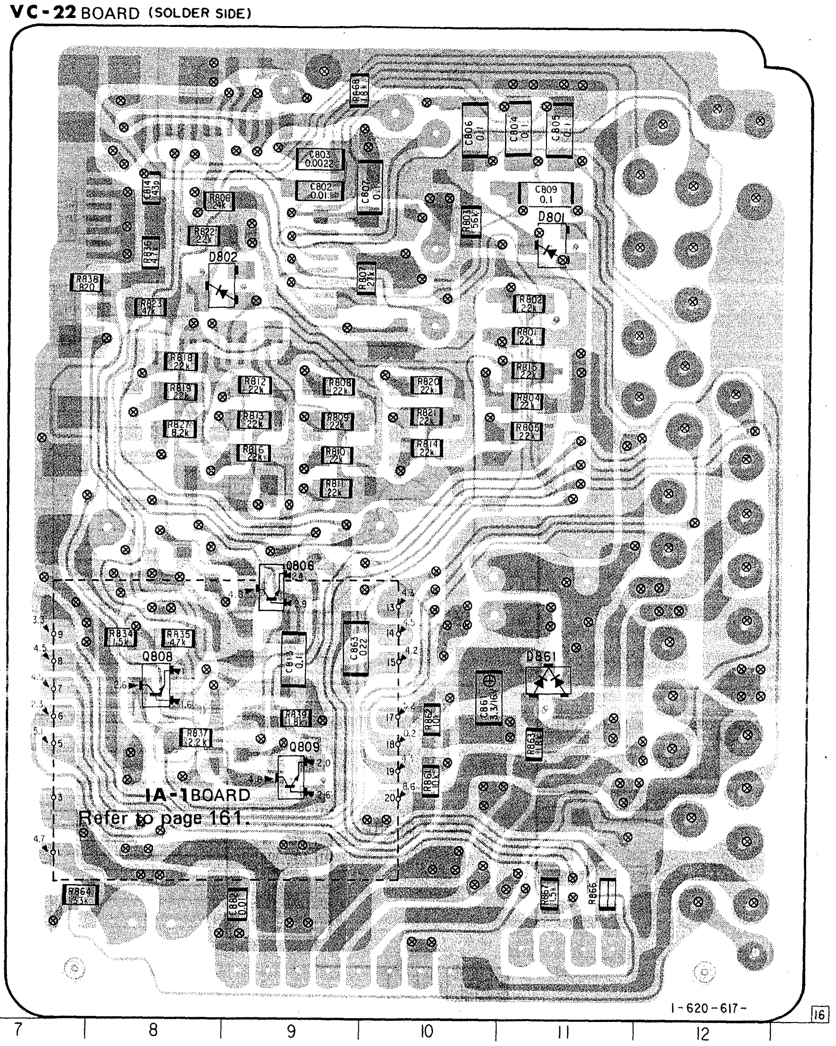
VC-21 BOARD (SOLDER SIDE)


MX-2 BOARD
Refer to page 157.
CAM OUT
GND
LLA
CAM DD ON
UNREG GND
NC
UNREG
TO MV-11 BOARD CN203
1-620-616-
16
7
8
9
10
11
12

VC-22 BOARD (COMPONENT SIDE) REC mode


TO CN-27 BOARD
A
B
C
D
E
F
G
TP804
TP802
TP803
TP801
TP861
IC801
RV802
RV809
RV803
RV805
RV808
RV801
RV806
RV804
RV810
Q801
Q802
Q803
Q804
Q805
Q807
Q861
Q862
Refer to page 161
IA-1 BOARD
CN861
CN881
1-620-617-
16
1
2
3
4
5
6
CN861
CN881
M904
IRIS MOTOR
LENS
UNREG
UNREG GND
CAM DD ON
20V
12V
GND
8.5V
5V
CAMERA
DC-DC CONVERTER

VC-22 BOARD (SOLDER SIDE)

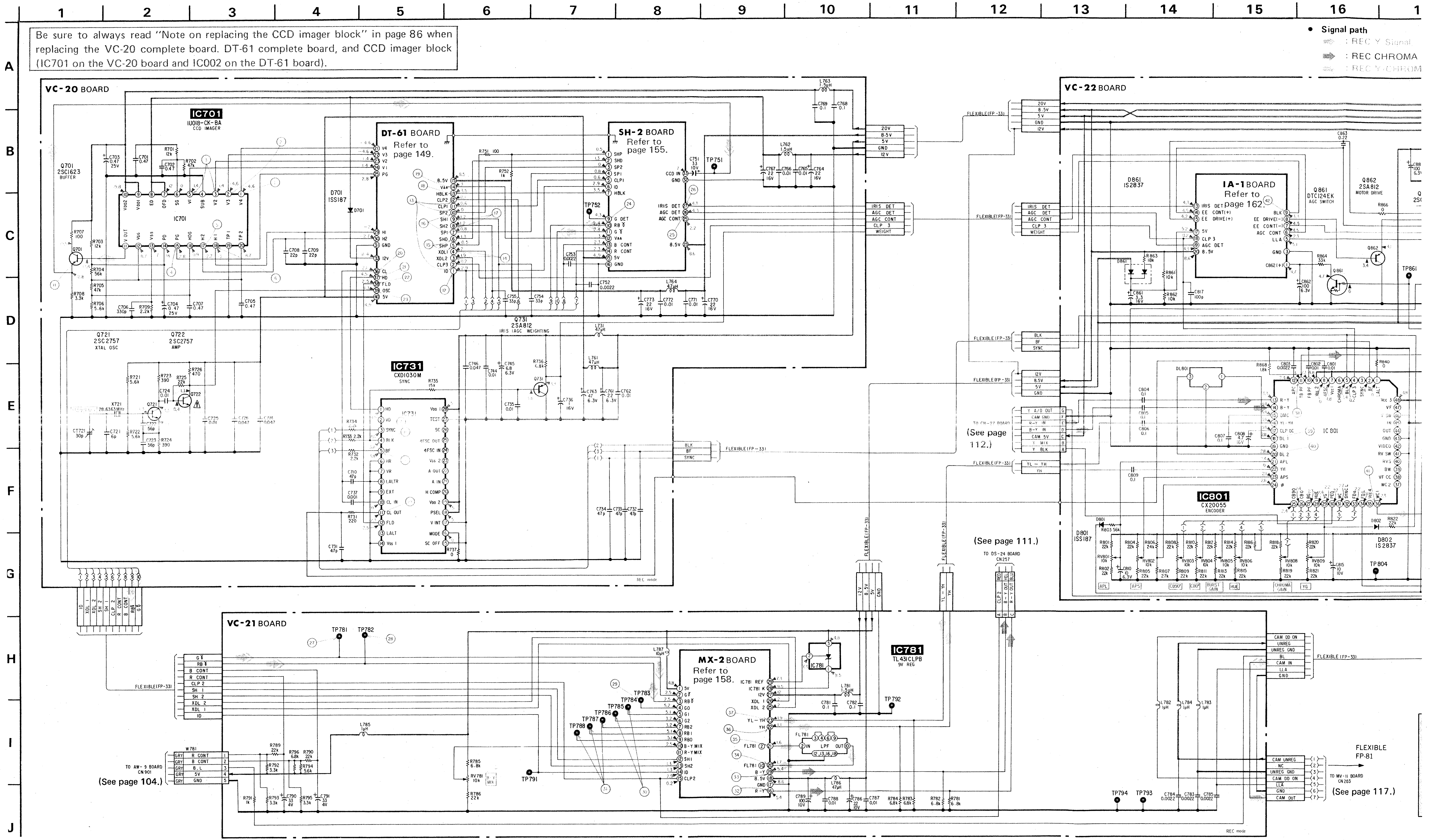

D801
D802
D861
Q806
Q808
Q809
IA-1 BOARD
Refer to page 161
1-620-617-
16
7
8
9
10
11
12

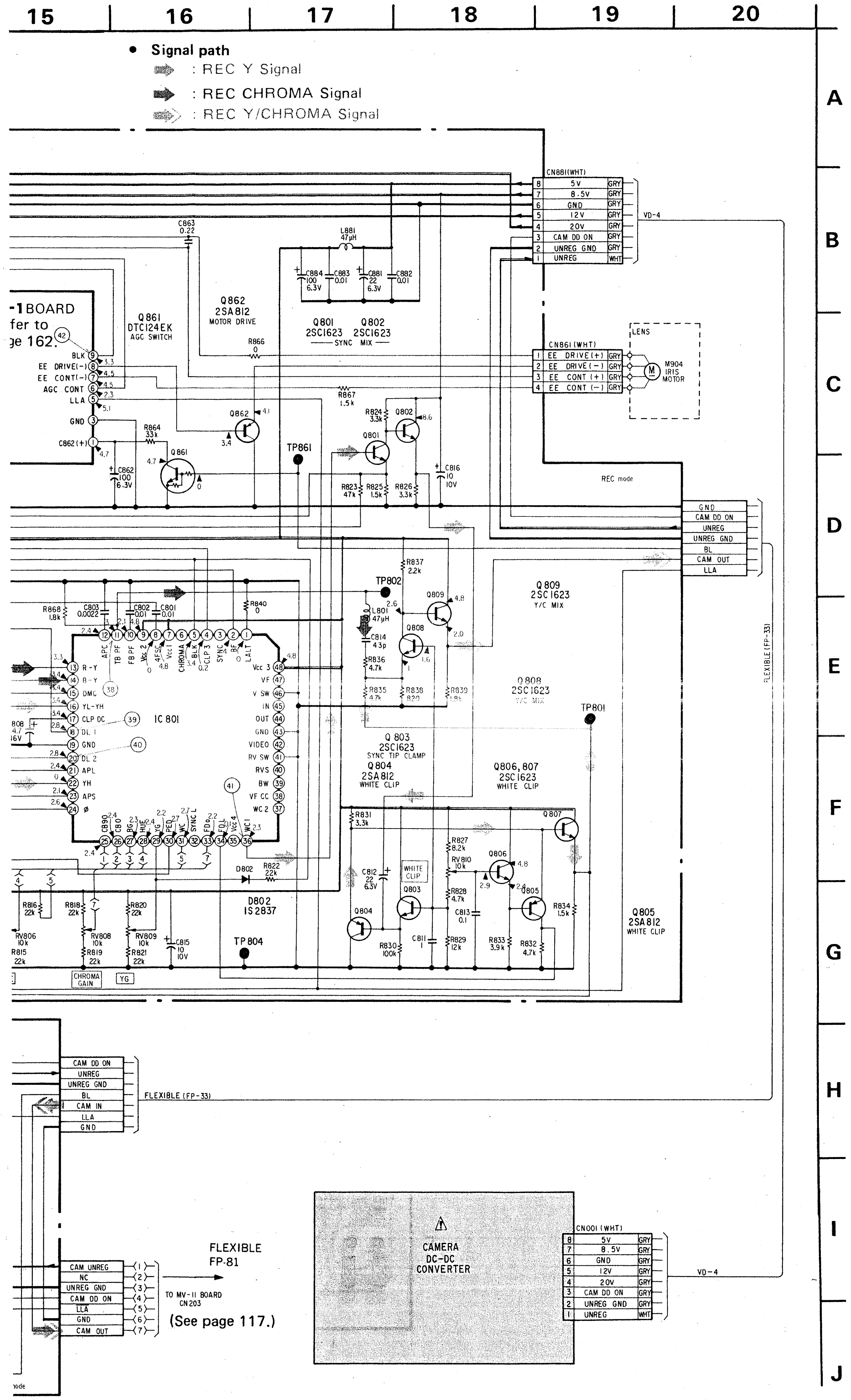
CN861	G-2	RV801	D-3
CN881	G-4	RV802	C-3
		RV803	C-4
D801	B-11	RV804	D-4
D802	B-8	RV805	C-5
D861	E-11	RV806	D-3
		RV808	C-5
IC801	B-5	RV809	C-3
		RV810	D-5
Q801	E-5		
Q802	E-5	TP801	D-6
Q803	E-5	TP802	A-4
Q804	F-4	TP803	D-4
Q805	F-5	TP804	A-1
Q806	E-9	TP805	A-2
Q807	E-5	TP806	C-1
Q808	E-8	TP807	C-2
Q809	F-9	TP808	E-1
Q861	G-6	TP861	G-1
Q862	F-2		

VC-20(CCD DRIVE, TIMING GENERATOR), VC-21(CAMERA MATRIX), VC-22(CAMERA ENCODER) SCHEMATIC DIAGRAM

—Ref. No. VC-20, VC-21 and VC-22 BOARDS : 1, 000 series—

Be sure to always read "Note on replacing the CCD imager block" in page 86 when replacing the VC-20 complete board. DT-61 complete board, and CCD imager block (IC701 on the VC-20 board and IC002 on the DT-61 board).

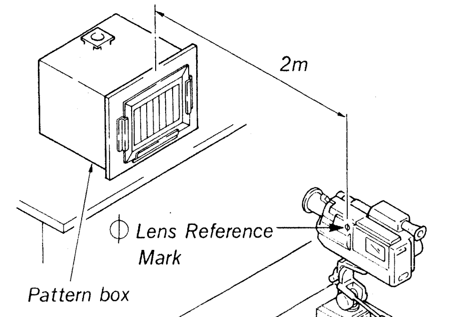

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
Signal path
: REC Y Signal
: REC CHROMA
: REC Y/CHROMA
VC-20 BOARD
IC701
IU018-CK-BA
CCD IMAGER
Q701
2SC1623
BUFFER
DT-61 BOARD
Refer to page 149.
SH-2 BOARD
Refer to page 155.
D701
1SS187
TP751
TP752
Q721
2SC2757
XTAL OSC
Q722
2SC2757
AMP
X721
28.6363MHz
Q731
2SA812
IRIS/AGC WEIGHTING
IC731
CXD1030M
SYNC
FLEXIBLE (FP-33)
FLEXIBLE (FP-331)
20V
8.5V
5V
GND
12V
IRIS DET
AGC DET
AGC CONT
CLP 3
WEIGHT
BLK
BF
SYNC
VC-22 BOARD
IA-1 BOARD
Refer to page 162.
D861
1S2837
Q861
DTC124EK
AGC SWITCH
Q862
2SA812
MOTOR DRIVE
TP861
IC801
CX20055
ENCODER
D801
1SS187
D802
1S2837
TP804
TO CN-27 BOARD
(See page 112.)
Y A/D OUT
CAM GND
R-Y IN
B-Y IN
CAM 5V
Y MIX
Y BLK
YL - YH
YH
(See page 111.)
TO DS-24 BOARD
CN257
APL
APS
C800
C80
BURST GAIN
HUE
CHROMA GAIN
YG
VC-21 BOARD
TP781
TP782
MX-2 BOARD
Refer to page 158.
IC781
TL431CLPB
9V REG
TP783
TP784
TP785
TP786
TP787
TP788
TP791
TP792
TP793
TP794
FL781
LPF
TO AW-9 BOARD
CN901
(See page 104.)
W781
R CONT
B CONT
B. L
5V
GND
CAM DD ON
UNREG
UNREG GND
BL
CAM IN
LLA
CAM UNREG
NC
CAM OUT
FLEXIBLE FP-81
TO MV-11 BOARD
CN203
(See page 117.)
REC mode


15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J
• Signal path
: REC Y Signal
: REC CHROMA Signal
: REC Y/CHROMA Signal
CN881(WHT)
5V
8.5V
GND
12V
20V
CAM DD ON
UNREG GND
UNREG
VD-4
CN861(WHT)
EE DRIVE(+)
EE DRIVE(−)
EE CONT(+)
EE CONT(−)
LENS
M904 IRIS MOTOR
Q861 DTC124EK AGC SWITCH
Q862 2SA812 MOTOR DRIVE
Q801 2SC1623
Q802 2SC1623
SYNC MIX
TP861
TP802
TP801
TP804
Q809 2SC1623 Y/C MIX
Q808 2SC1623 Y/C MIX
Q803 2SC1623 SYNC TIP CLAMP
Q804 2SA812 WHITE CLIP
Q806, 807 2SC1623 WHITE CLIP
Q805 2SA812 WHITE CLIP
IC 801
D802 1S2837
CHROMA GAIN
YG
REC mode
FLEXIBLE (FP-33)
CAM DD ON
UNREG
UNREG GND
BL
CAM IN
LLA
GND
CAM OUT
CAMERA DC-DC CONVERTER
CN001(WHT)
FLEXIBLE FP-81
TO MV-11 BOARD CN203
(See page 117.)

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

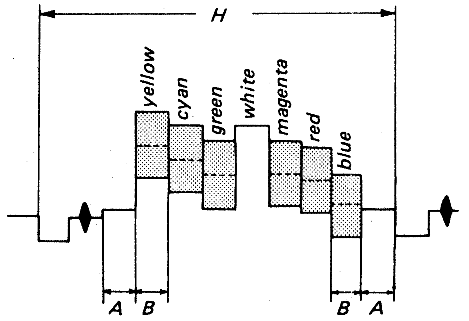

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

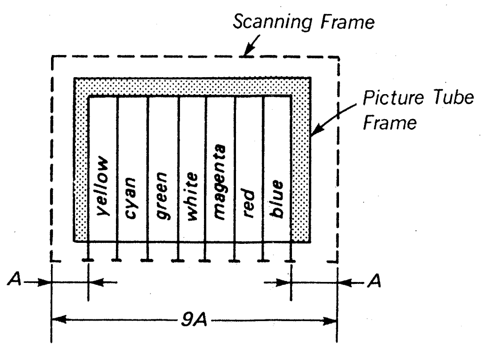
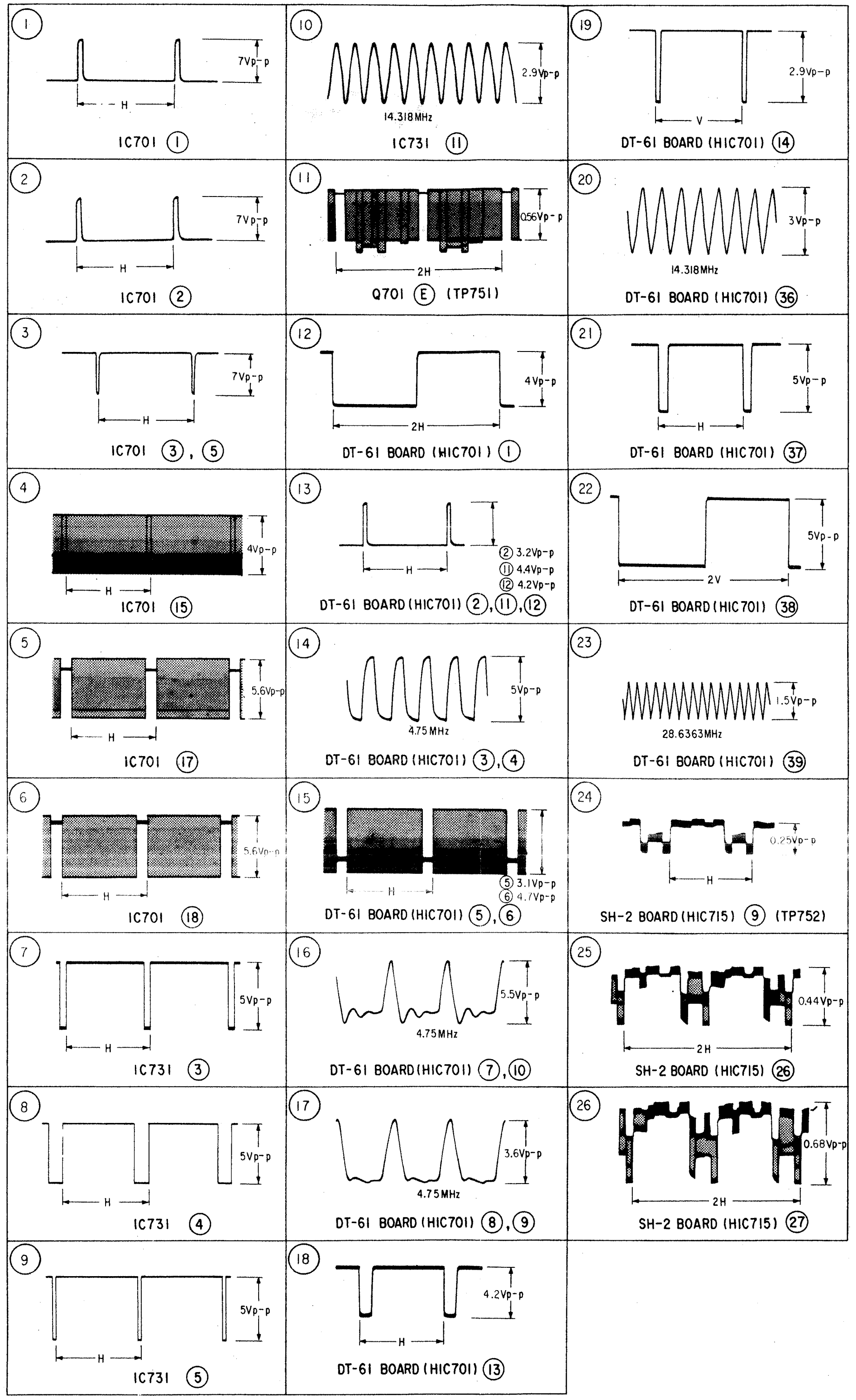

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

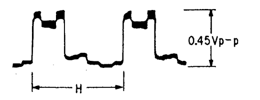
VC-20 BOARD



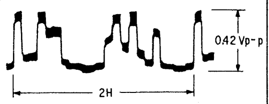
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

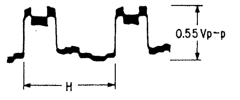
VC-21 BOARD

㉗


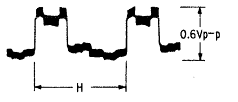
TP781

㉘


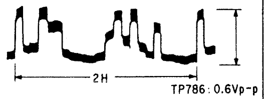
TP782

㉙


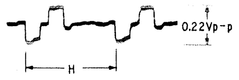
TP783

㉚


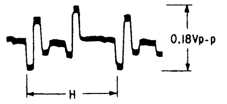
TP784 ,785

㉛


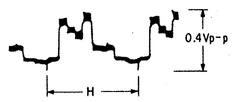
TP786,787,788
TP786 : 0.6Vp-p
TP787 :0.59Vp-p
TP788 :0.52Vp-p

㉜


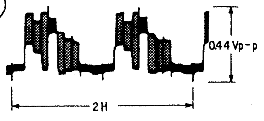
MX-2 BOARD(HIC781) ⑯

㉝


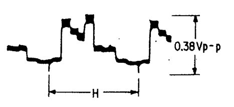
MX-2 BOARD(HIC781) ⑲

㉞


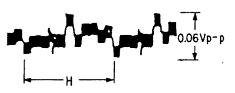
MX-2 BOARD (HIC781) ⑳

㉟


MX-2 BOARD(HIC781) ㉑

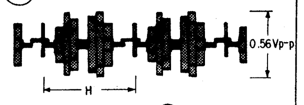
㊱


MX-2 BOARD (HIC781) ㉒

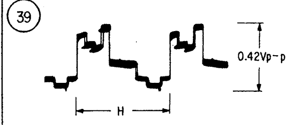
㊲


MX-2 BOARD (HIC781) ㉓

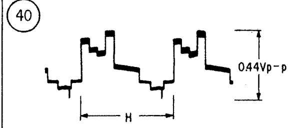
VC- 22 BOARD

㊳


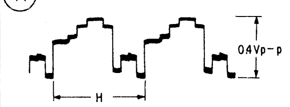
IC801 ⑪

㊴


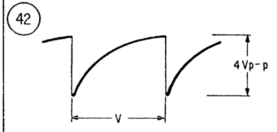
IC801 ⑱

㊵


IC801 ⑳

㊶


IC801 ㊱

㊷


IA-1 BOARD ⑨

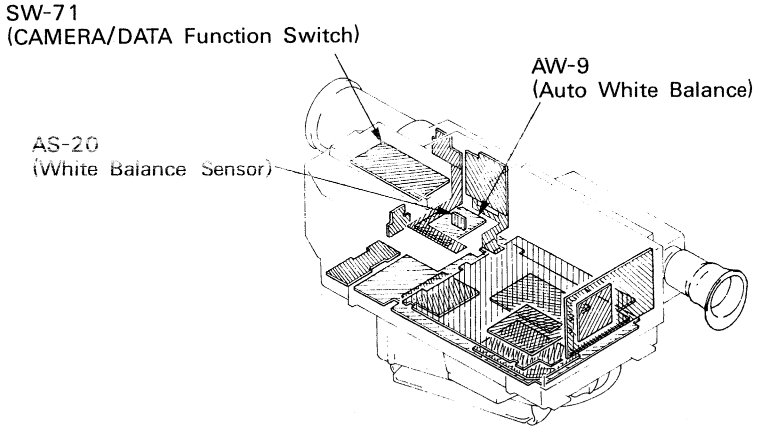
Note:

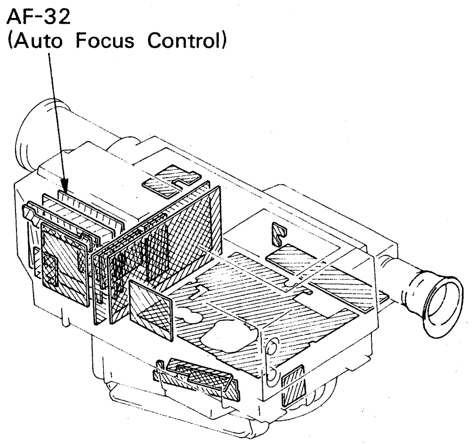
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.
- Digital transistor (AW-9: Q901, Q902, Q903, Q904, Q905, Q906, Q907, Q908, Q909, Q910, Q911, Q912) transistor with resistor.
- Refer to the AW-9 board schematic diagram for digital transistor.

Caution:

Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

When indicating parts by reference number, please include the board name.


SW-71
(CAMERA/DATA Function Switch)
AW-9
(Auto White Balance)
AS-20
(White Balance Sensor)

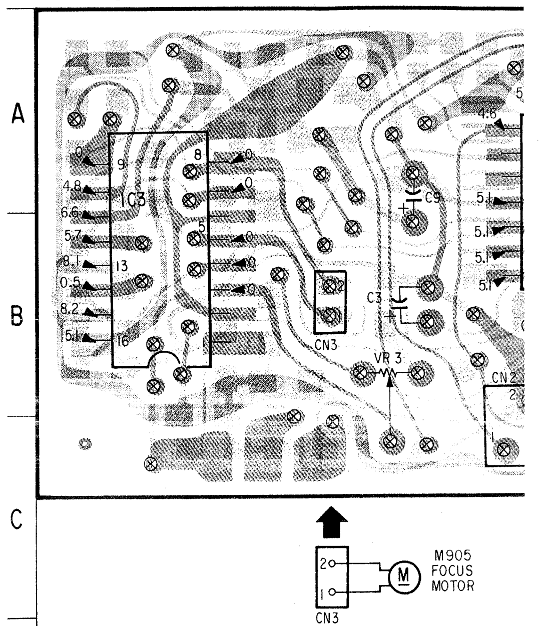

AF-32
(Auto Focus Control)

AF-32(AUTO FOCUS CONTROL), AW-9(AUTO

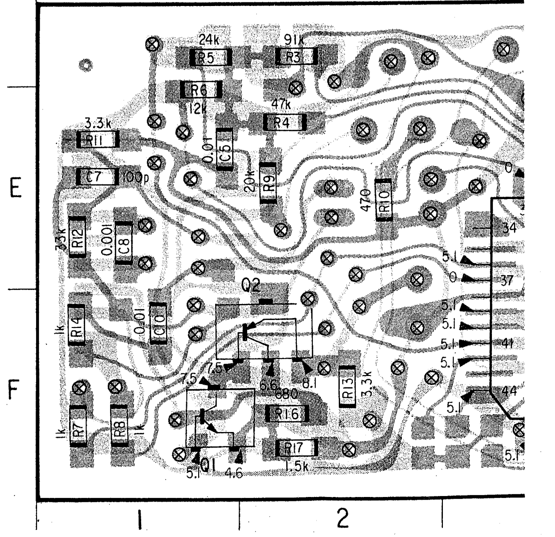
—Ref. No. AF-32, AW-9 and SW-71 BOARDS: 2,00

CN1	B-5
CN2	B-3
CN3	B-2
CN4	B-4
IC1	A-3
IC2	F-3
IC3	B-1
Q1	F-1
Q2	F-2
RV1	B-4
RV2	B-5

AF - 32 BOARD (COMPONENT SIDE)

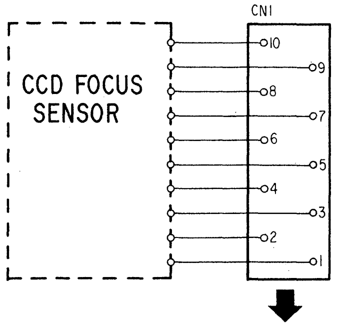

A
B
C
IC3
9
8
16
C9
C3
CN3
VR 3
CN2
M905
FOCUS
MOTOR
CN3

AF - 32 BOARD (SOLDER SIDE)

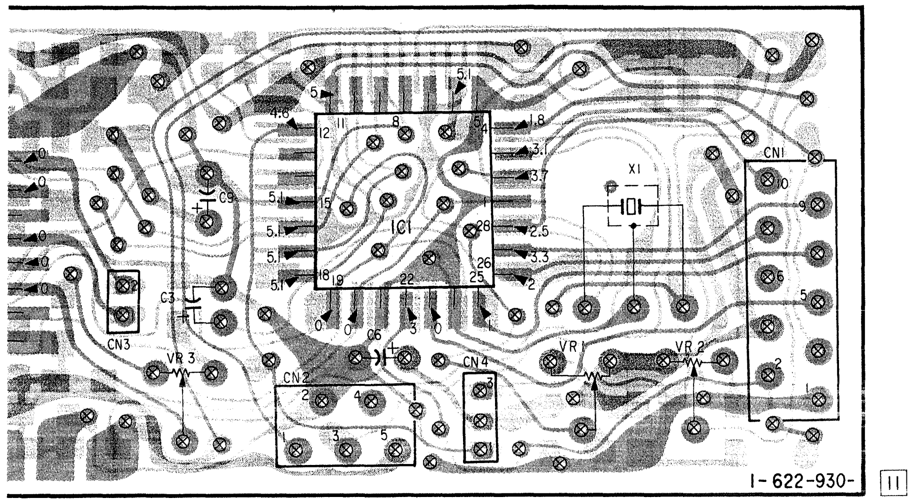

D
E
F
1
2
R5
R3
R6
R4
R11
C7
C6
C8
R9
R10
R12
Q2
R14
R13
R16
R7
R8
R17
Q1
24k
91k
47k
12k
3.3k
100p
0.001
1k
33k
20k
470
3.3k
1.5k

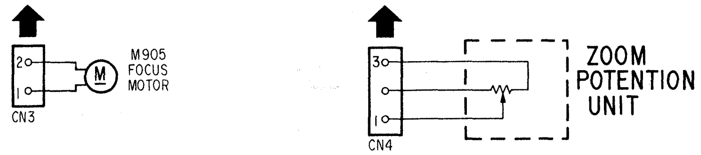
S CONTROL), ~~AW-9~~(AUTO WHITE BALANCE), SW-71(CAMERA/DATA FUNCTION SWITCH), AS-20(WHITE BALANCE SENSOR) PRINTED WIRING BOARDS

-9 and SW-71 BOARDS: 2,000 Series—


CCD FOCUS SENSOR
CN1
10
9
8
7
6
5
4
3
2
1

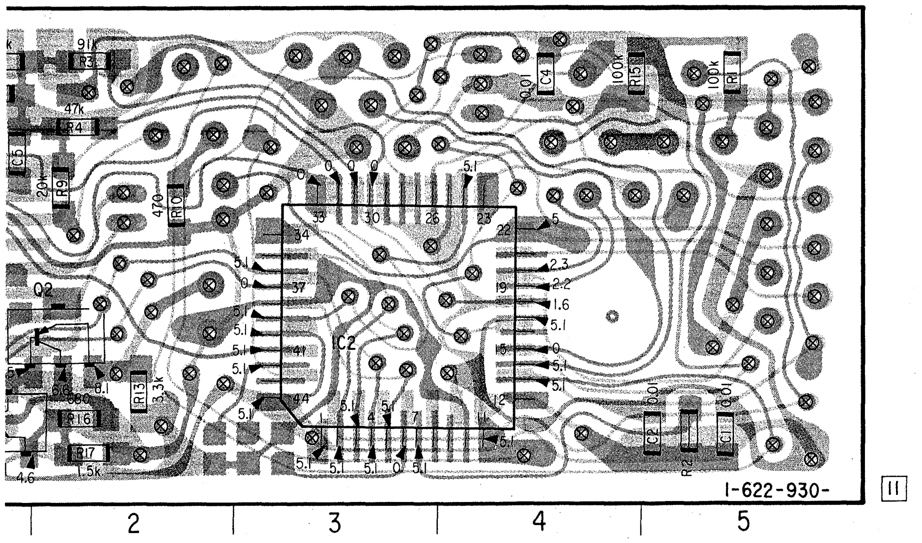
RD (COMPONENT SIDE)


IC1
X1
CN1
CN2
CN3
CN4
VR 1
VR 2
VR 3
C3
C5
1-622-930-
11

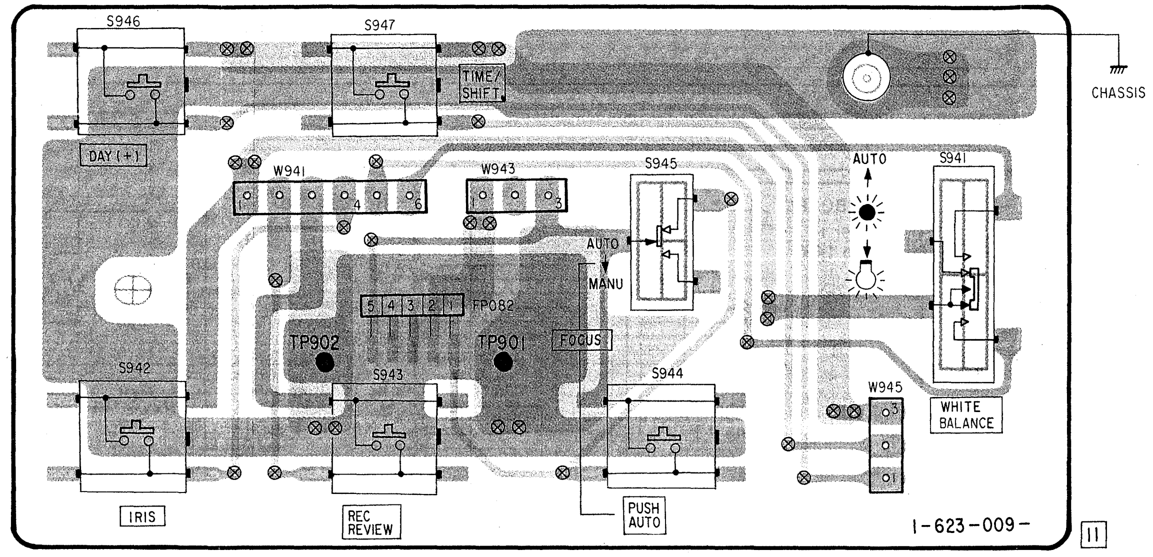

CN3
M
M905 FOCUS MOTOR
CN4
ZOOM POTENTION UNIT

no mark : REC mode

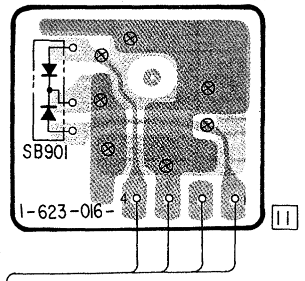
RD (SOLDER SIDE)


IC2
1-622-930-
11
2
3
4
5

SW-71 BOARD (COMPONENT SIDE)

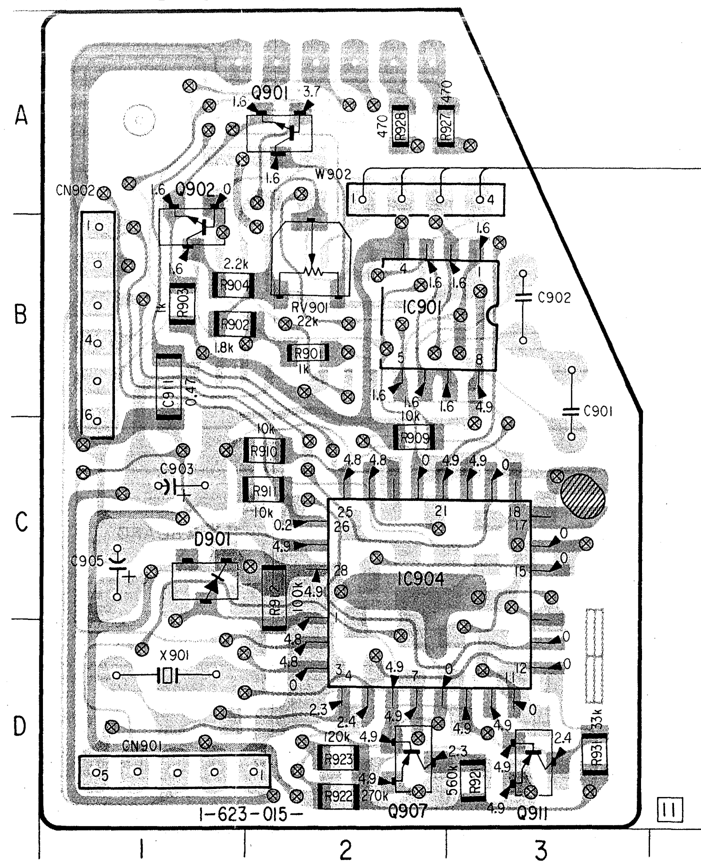

S946
S947
TIME/SHIFT
DAY (+)
W941
W943
S945
AUTO
MANU
S941
FP082
TP902
TP901
FOCUS
S942
S943
S944
W945
WHITE BALANCE
IRIS
REC REVIEW
PUSH AUTO
1-623-009-
11
CHASSIS

AS-20 BOARD (SOLDER SIDE)


SB901
1-623-016-
11

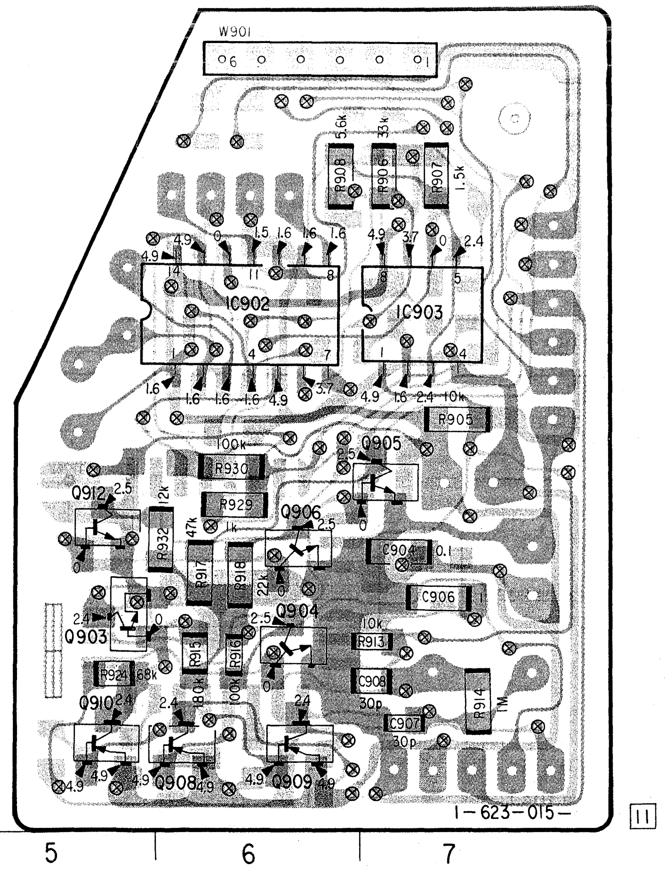
CN902	A-1
D901	C-1
IC901	B-3
IC902	B-6
IC903	B-7
IC904	C-2
Q901	A-2
Q902	B-1
Q903	D-5
Q904	D-6
Q905	C-7
Q906	C-6
Q907	D-2
Q908	D-6
Q909	D-6
Q910	D-5
Q911	D-3
Q912	C-5
RV901	B-2
W901	A-6

AW-9 BOARD (COMPONENT SIDE)


A
B
C
D
CN902
Q901
Q902
W902
IC901
RV901
C902
C901
C903
C905
D901
IC904
X901
CN901
Q907
Q911
1-623-015-
11
1
2
3
4

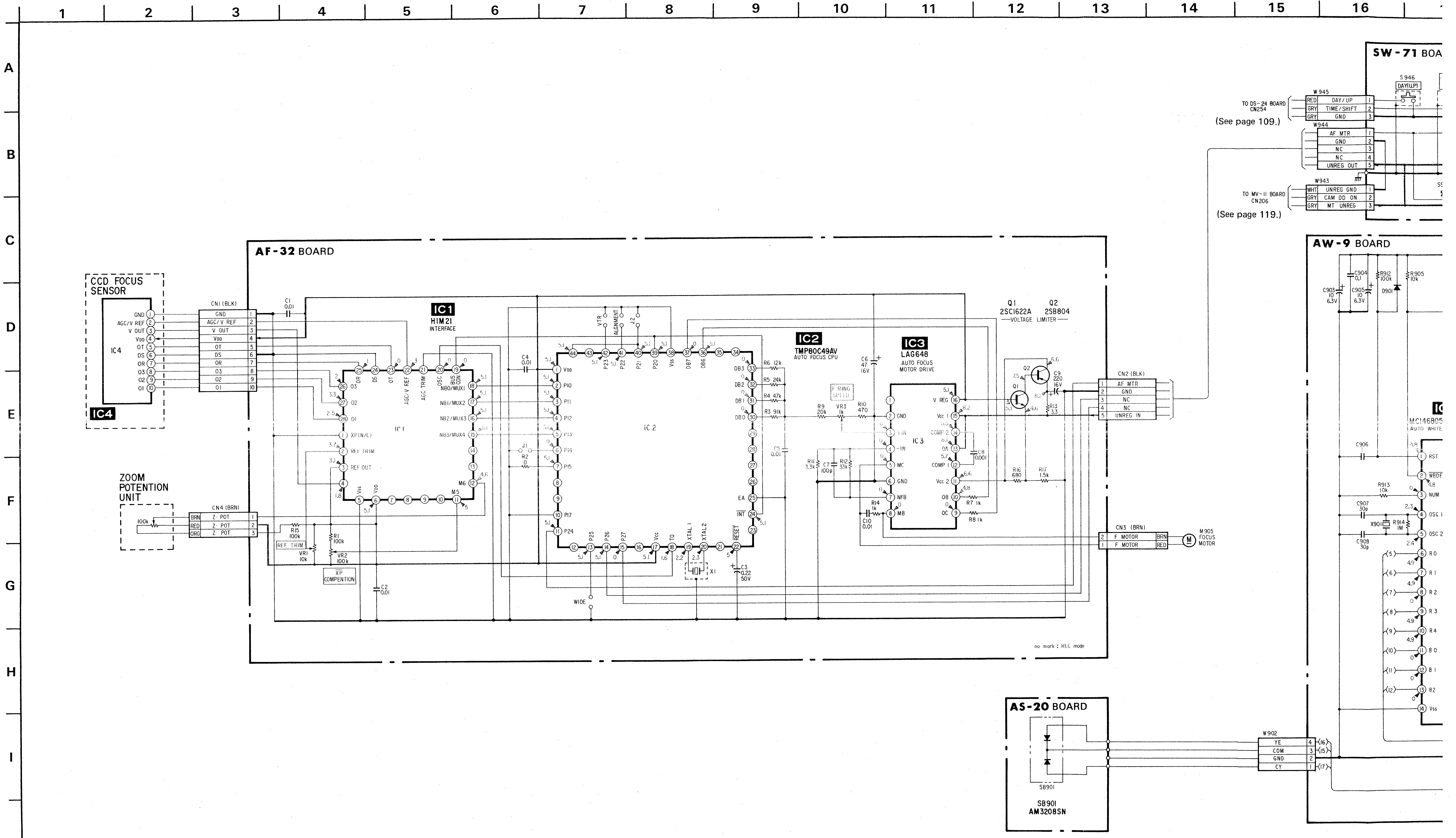
no mark : REC mode

AW-9 BOARD (SOLDER SIDE)

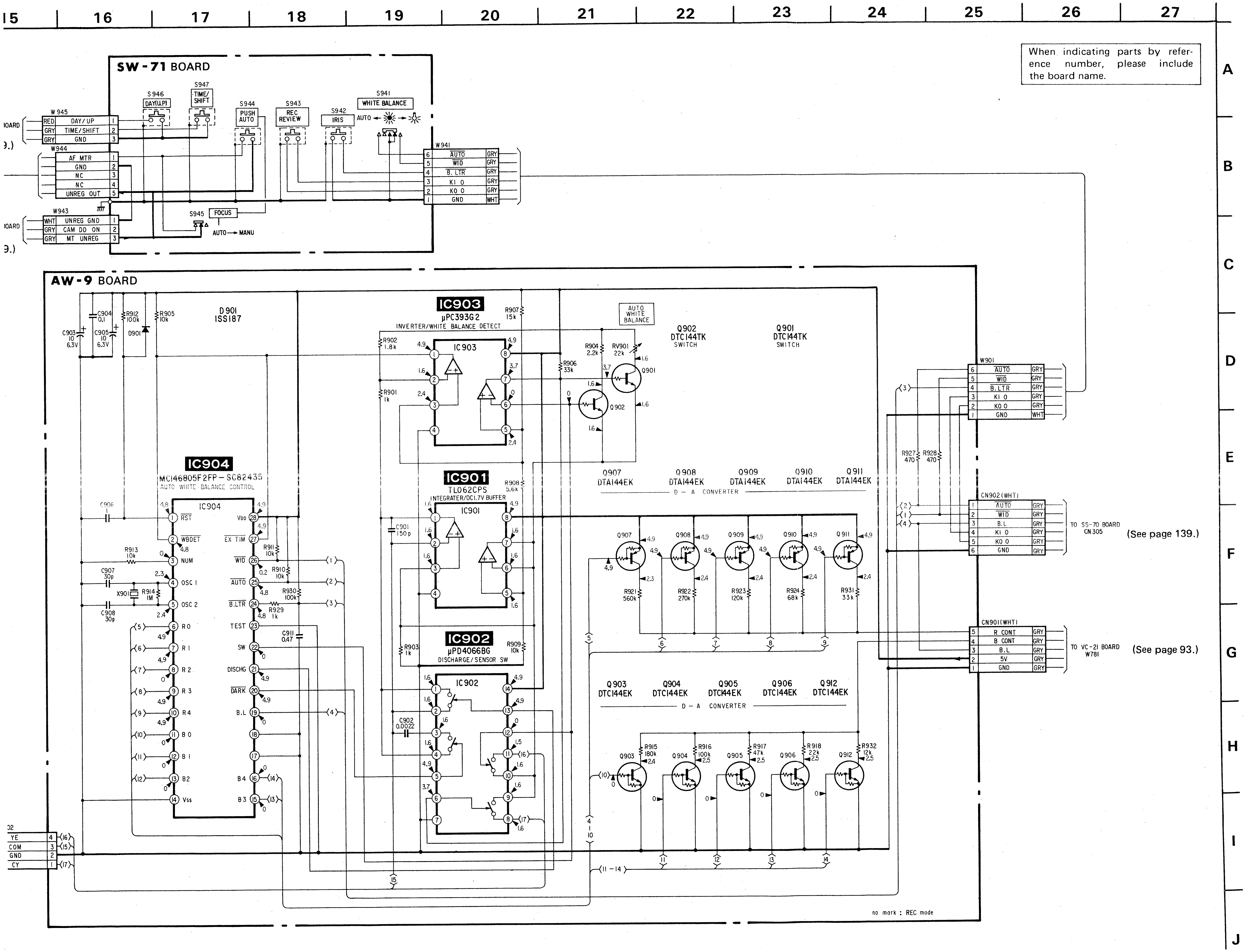

W901
IC902
IC903
Q905
Q912
Q906
Q903
Q904
Q910
Q908
Q909
1-623-015-
11
5
6
7

AF-32(AUTO FOCUS CONTROL), AW-9(AUTO WHITE BALANCE), SW-71(CAMERA/DATA FUNCTION SWITCH), AS-20(WHITE BALANCE SENSOR) SCHEMATIC DIAGRAM

—Ref. No. AF-32, AW-9 and SW-71 BOARDS: 2,000 Series—



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
CCD FOCUS SENSOR
IC4
GND
AGC/V REF
V OUT
VDD
OT
DS
OR
O3
O2
O1
CN1 (BLK)
ZOOM POTENTION UNIT
100k
CN4 (BRN)
Z-POT
BRN
RED
ORG
AF-32 BOARD
IC1
HIM21
INTERFACE
IC 1
XP(N/C)
REF TRIM
REF OUT
NB0/MUX1
NB1/MUX2
NB2/MUX3
NB3/MUX4
M5
M6
AGC/V REF
AGC TRIM
OSC
BUS CON
R15 100k
REF TRIM
VR1 10k
R1 100k
VR2 100k
XP COMPENTION
C1 0.01
C2 0.01
C4 0.01
J1
R2 0
IC2
TMP80C49AV
AUTO FOCUS CPU
IC 2
VDD
P10
P11
P12
P13
P14
P15
P17
P24
P25
P26
P27
VCC
T0
XTAL 1
XTAL 2
RESET
DB0
DB1
DB2
DB3
DB6
DB7
EA
INT
VSS
P20
P21
P22
P23
VTR
ALIGNMENT
J2
WIDE
X1
C3 0.22 50V
C5 0.01
R6 12k
R5 24k
R4 47k
R3 91k
F RING SPEED
R9 20k
VR3 1k
R10 470
R11 3.3k
C7 100p
R12 33k
R14 1k
C10 0.01
C6 47 16V
IC3
LAG648
AUTO FOCUS MOTOR DRIVE
IC 3
GND
+IN
-IN
MC
NFB
MB
V REG
VCC 1
COMP 2
OA
COMP 1
VCC 2
OB
OC
C8 0.001
R7 1k
R8 1k
Q1 2SC1622A
Q2 2SB804
VOLTAGE LIMITER
C9 220 16V
R13 3.3
R16 680
R17 1.5k
CN2 (BLK)
AF MTR
GND
NC
NC
UNREG IN
CN3 (BRN)
F MOTOR
M905 FOCUS MOTOR
no mark : REC mode
AS-20 BOARD
SB901
SB901 AM3208SN
W902
YE
COM
GND
CY
SW-71 BOARD
S946 DAY(UP)
W945
DAY/UP
TIME/SHIFT
GND
TO DS-24 BOARD CN254
(See page 109.)
W944
AF MTR
GND
NC
NC
UNREG OUT
W943
UNREG GND
CAM DD ON
MT UNREG
TO MV-11 BOARD CN206
(See page 119.)
AW-9 BOARD
C903 10 6.3V
C904 0.1
C905 10 6.3V
R912 100k
D901
R905 10k
C906
R913 10k
C907 30p
X901
R914 1M
C908 30p
MC146805
AUTO WHITE
RST
WBDE
NUM
OSC 1
OSC 2
R0
R1
R2
R3
R4
B0
B1
B2
VSS

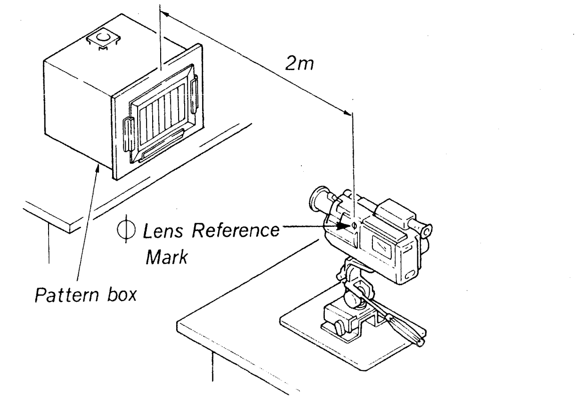

SW-71 BOARD
S946 DAY(U.P)
S947 TIME/SHIFT
S944 PUSH AUTO
S943 REC REVIEW
S942 IRIS
S941 WHITE BALANCE
AUTO
S945 FOCUS
AUTO → MANU
W945
DAY/UP
TIME/SHIFT
GND
W944
AF MTR
GND
NC
NC
UNREG OUT
W943
UNREG GND
CAM DD ON
MT UNREG
W941
AUTO
WID
B. LTR
KI O
KO O
GND
AW-9 BOARD
D901 ISS187
IC903 µPC393G2 INVERTER/WHITE BALANCE DETECT
AUTO WHITE BALANCE
Q902 DTC144TK SWITCH
Q901 DTC144TK SWITCH
IC904 MC146805F2FP-SC82435 AUTO WHITE BALANCE CONTROL
IC901 TL062CPS INTEGRATER/DC1.7V BUFFER
IC902 µPD4066BG DISCHARGE/SENSOR SW
Q907 DTA144EK
Q908 DTA144EK
Q909 DTA144EK
Q910 DTA144EK
Q911 DTA144EK
D - A CONVERTER
Q903 DTC144EK
Q904 DTC144EK
Q905 DTC144EK
Q906 DTC144EK
Q912 DTC144EK
D - A CONVERTER
W901
CN902(WHT)
TO SS-70 BOARD CN305
(See page 139.)
CN901(WHT)
R CONT
B CONT
B.L
5V
GND
TO VC-21 BOARD W781
(See page 93.)
YE
COM
GND
CY
no mark : REC mode

When indicating parts by reference number, please include the board name.

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

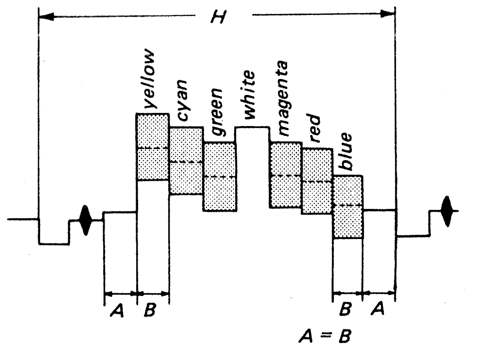

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

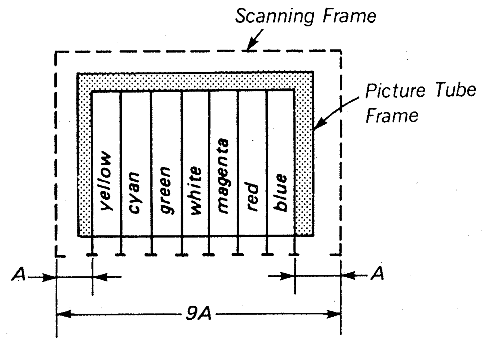

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

DS-24(DATA DISPLAY, DIGITAL TITLER), RZ-1 (ZOOM DRIVER), CN-27(RELAY), SK-21 (DIGITAL TITLER FUNCTION SWITCH), LI-3(LI

—Ref. No. DS-24, RZ-1, CN-27 and SK-21 BOARDS: 3, 000 Series—

Note:

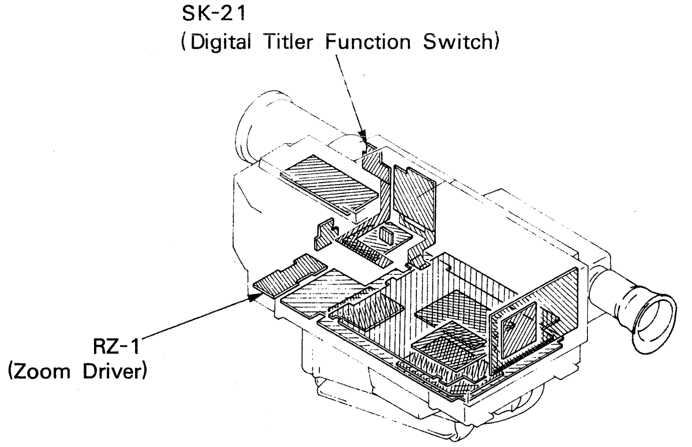
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.
- Digital transistor (DS-24: Q114, Q116, Q117, RZ-1: Q119, Q121, Q123) transistor with resistor.
- Refer to the DS-24 and RZ-1 boards schematic diagram for digital transistor.

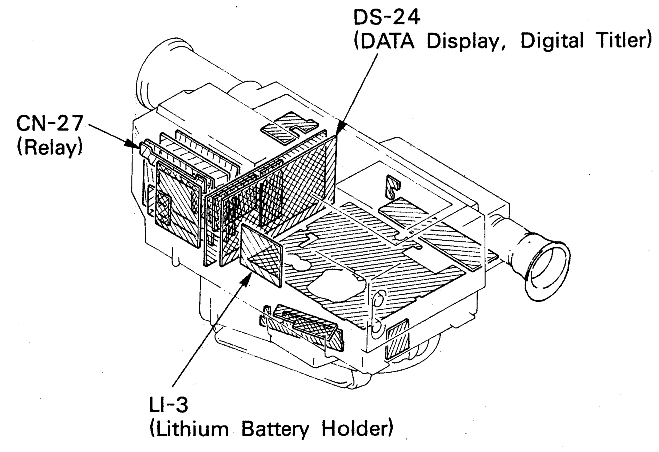
Caution:

Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

Measure the voltage and waveform of the DS-24 board by superimposing and turning the screen totally white.

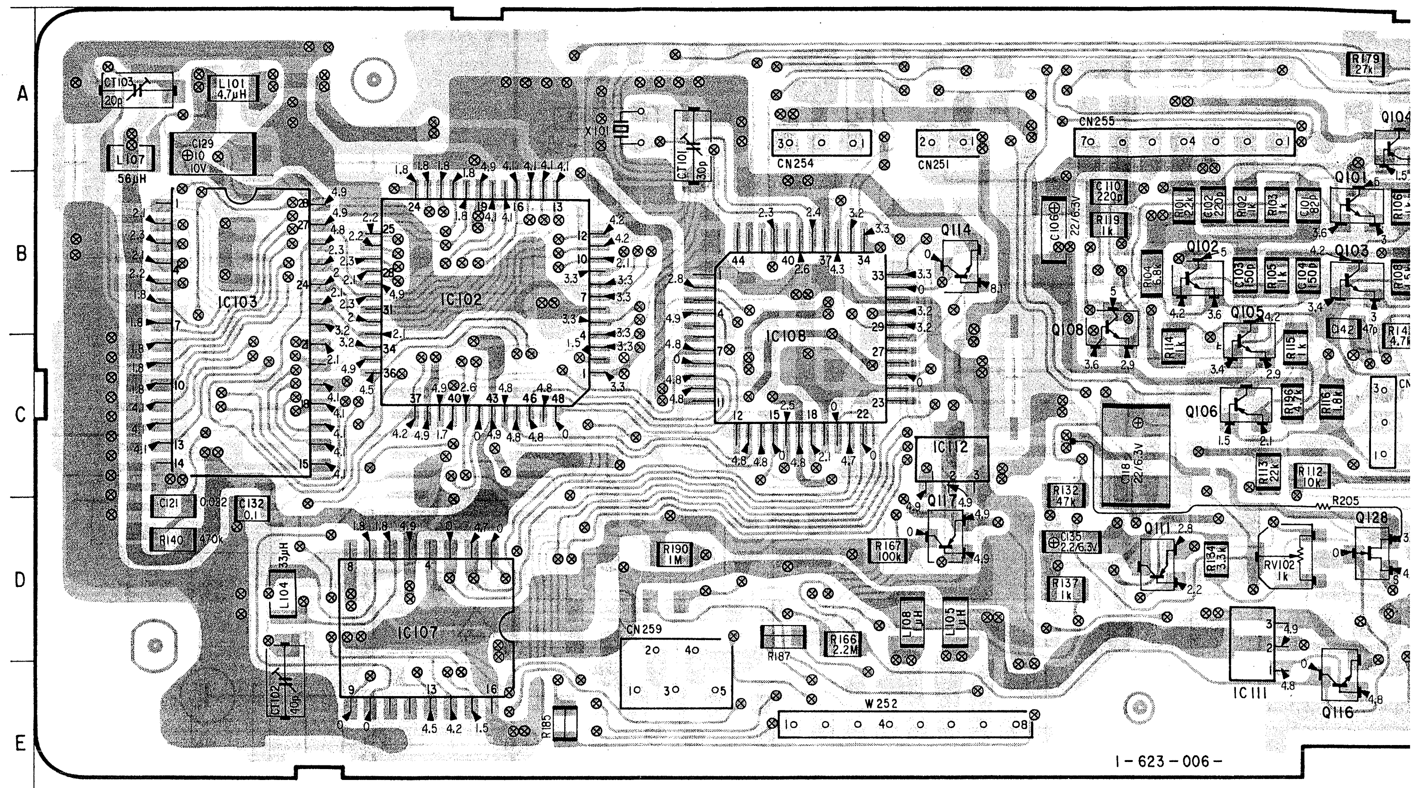
When indicating parts by reference number, please include the board name.


SK-21
(Digital Titler Function Switch)
RZ-1
(Zoom Driver)


DS-24
(DATA Display, Digital Titler)
CN-27
(Relay)
LI-3
(Lithium Battery Holder)

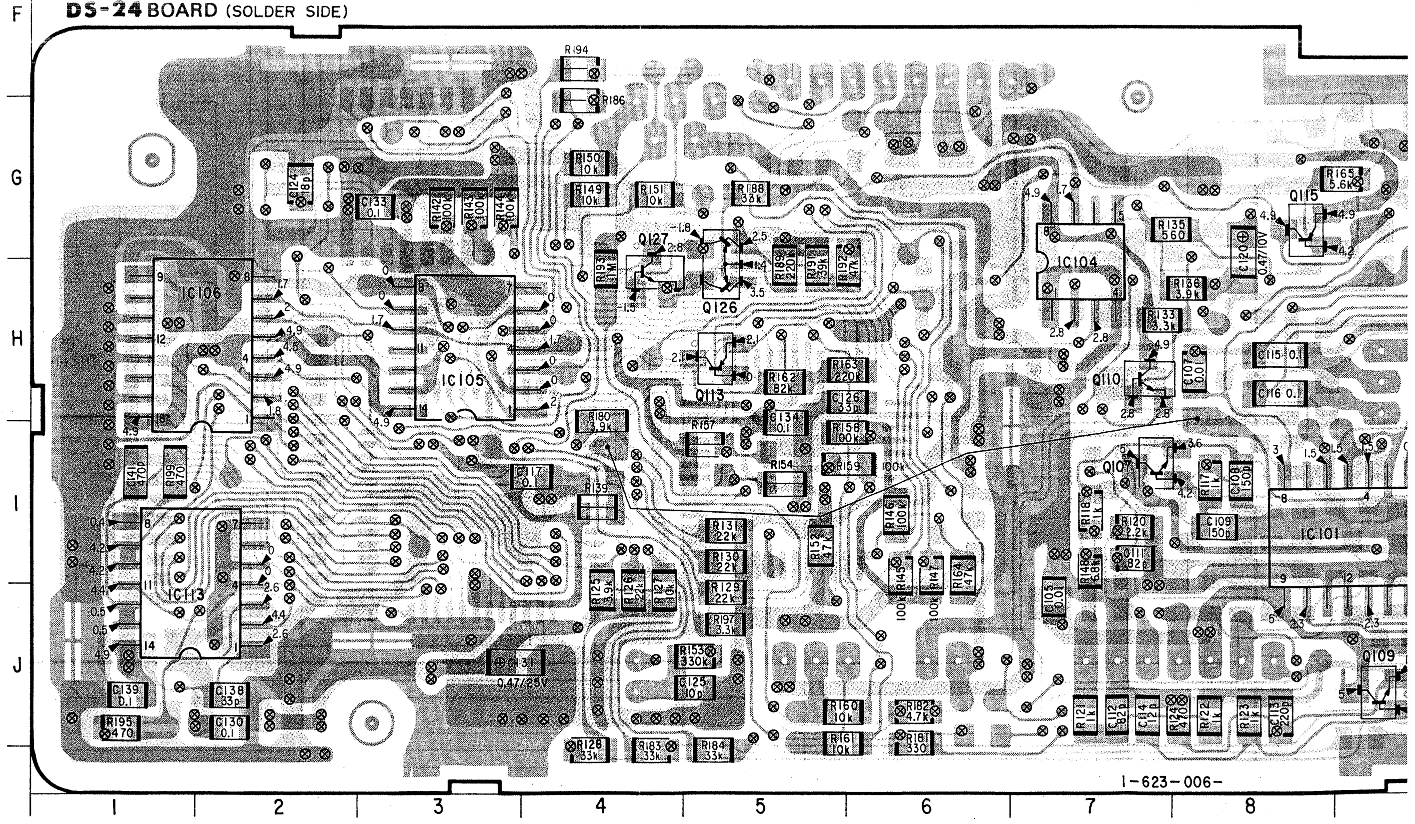
CN251	A-6
CN254	A-5
CN255	A-7
CN257	C-9
CN259	E-4
CT101	A-5
CT102	E-2
CT103	A-1
IC101	I-9
IC102	B-3
IC103	B-2
IC104	G-7
IC105	H-3
IC106	H-1
IC107	D-3
IC108	B-5
IC111	D-8
IC112	C-6
IC113	I-1
Q101	B-9
Q102	B-8
Q103	B-9
Q104	A-9
Q105	B-8
Q106	C-8
Q107	I-7
Q108	B-7
Q109	J-9
Q110	H-7
Q111	D-7
Q112	H-5
Q113	H-5
Q114	B-6
Q115	G-8
Q116	D-9
Q117	D-6
Q126	G-5
Q127	H-4
Q128	D-9
RV101	D-9
RV102	D-8
W252	E-6

DS-24 BOARD (COMPONENT SIDE)

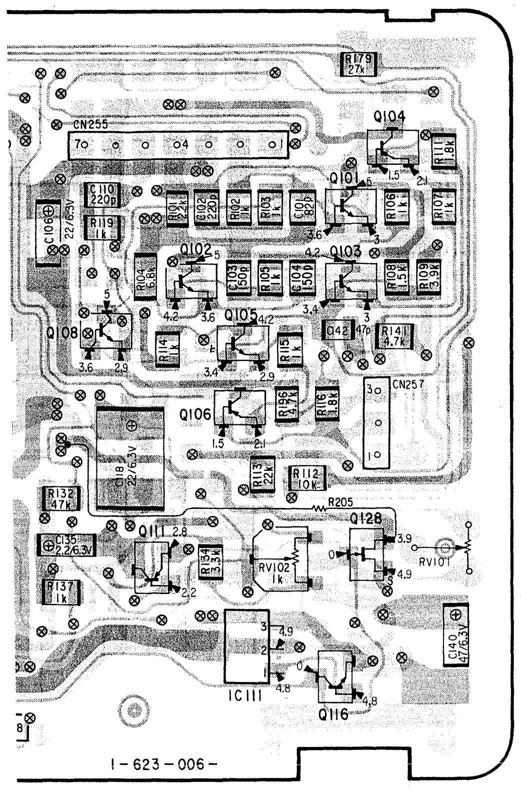

A
B
C
D
E
IC103
IC102
IC108
IC107
IC112
IC111
Q101
Q102
Q103
Q105
Q106
Q108
Q111
Q114
Q116
Q117
Q128
CN254
CN251
CN255
CN259
W252
1-623-006-

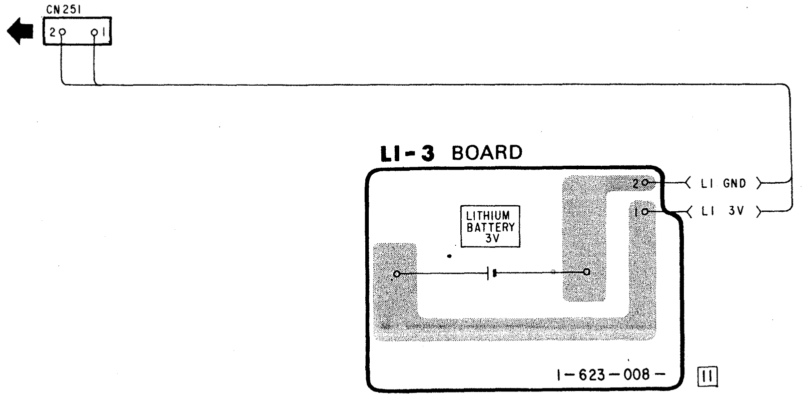
no mark : REC m

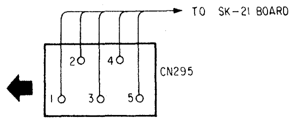
DS-24 BOARD (SOLDER SIDE)

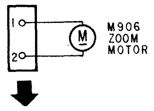

F
G
H
I
J
1
2
3
4
5
6
7
8
IC106
IC105
IC104
IC113
IC101
Q127
Q126
Q113
Q115
Q110
Q107
Q109
1-623-006-

LER FUNCTION SWITCH), LI-3(LITHIUM BATTERY HOLDER) PRINTED WIRING BOARDS

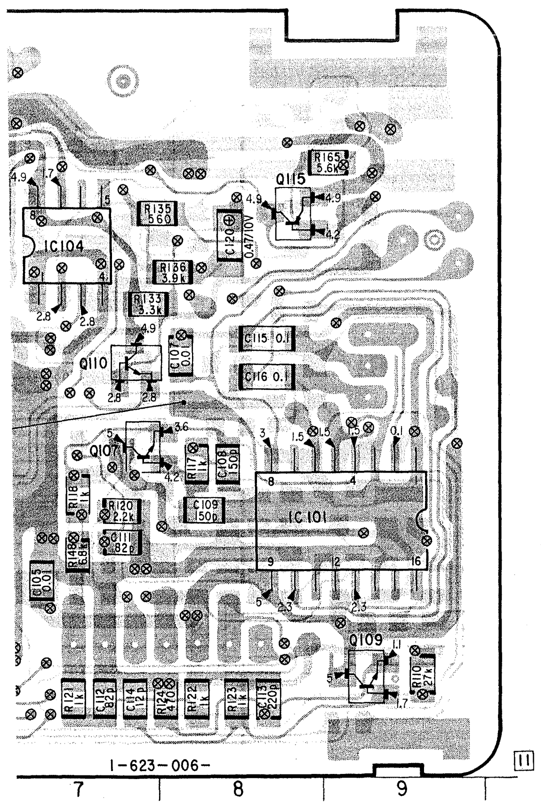

CN255
Q104
Q101
Q102
Q103
Q105
Q106
Q108
Q111
Q128
Q116
IC111
CN257
RV101
RV102 1k
R205
1-623-006-


CN251
LI-3 BOARD
LITHIUM BATTERY 3V
LI GND
LI 3V
1-623-008-


TO SK-21 BOARD
CN295

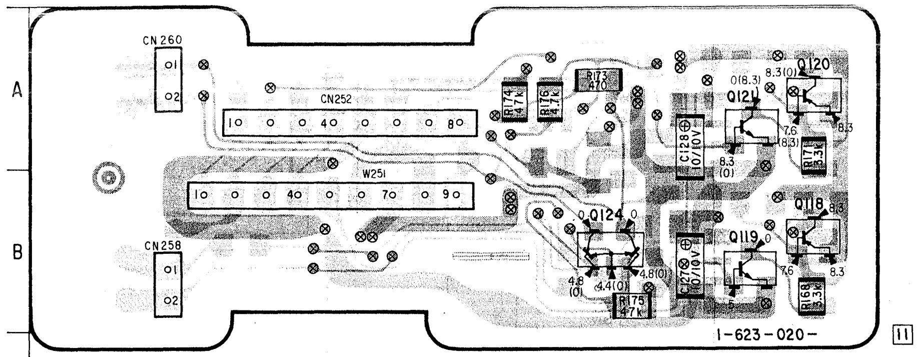

M906
ZOOM MOTOR

no mark : REC mode


IC104
Q115
Q110
Q107
IC101
Q109
1-623-006-
7
8
9

CN252	A-2
CN258	B1
CN260	A-1
D101	E-4
IC109	D-5
IC110	E-5
Q118	B-5
Q119	B-5
Q120	A-5
Q121	A-5
Q123	D-4
Q124	B-4
Q125	E-4
W251	B-3

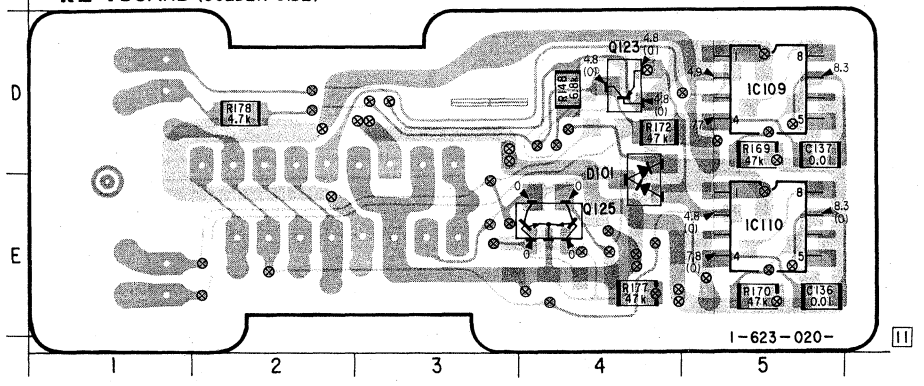
RZ-1 BOARD (COMPONENT SIDE)


A
B
CN260
CN252
W251
CN258
Q120
Q121
Q124
Q119
Q118
1-623-020-

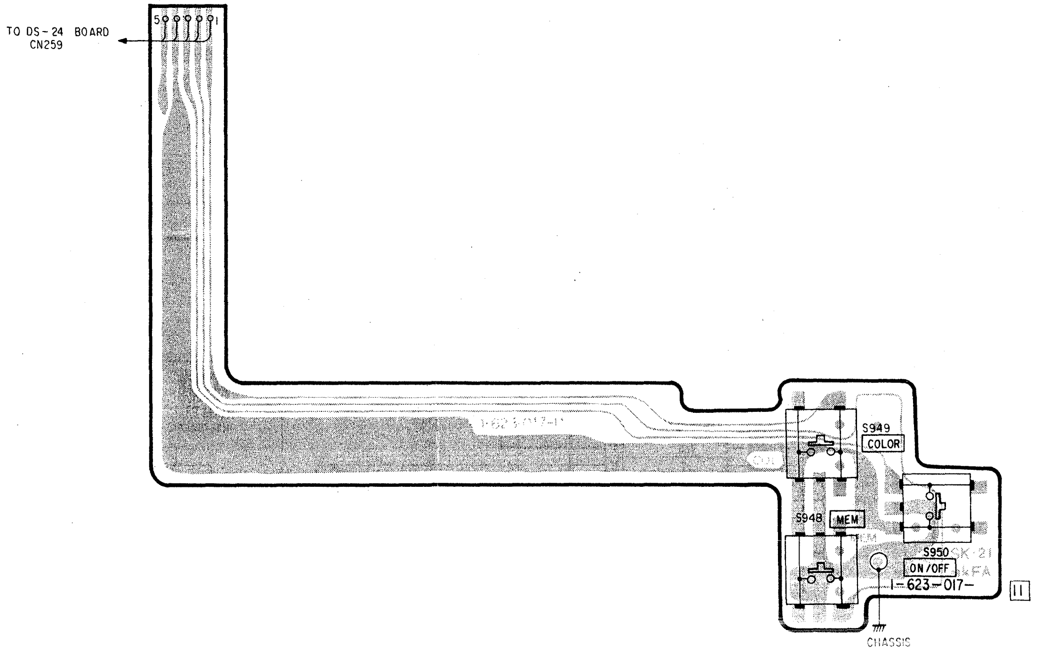
C

no mark : REC mode
( ) : PB mode

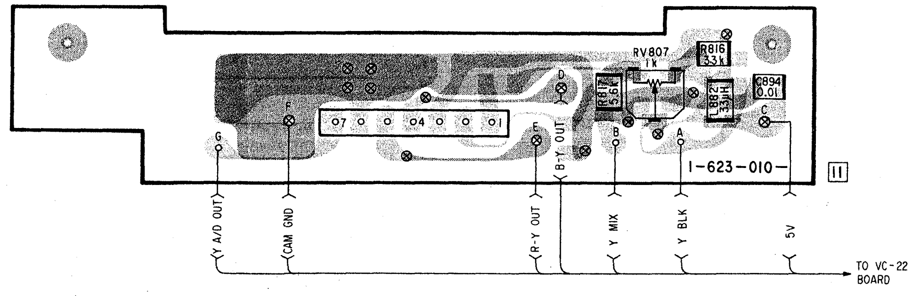
RZ-1 BOARD (SOLDER SIDE)


D
E
Q123
IC109
D101
Q125
IC110
1-623-020-
1
2
3
4
5

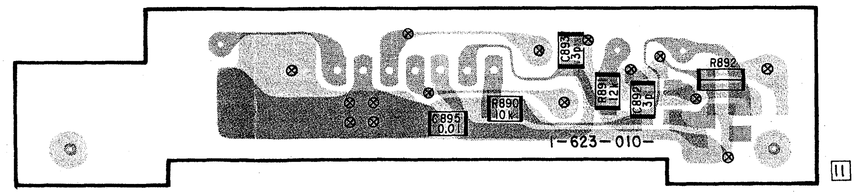
SK-21 BOARD


TO DS-24 BOARD CN259
S949 COLOR
S948 MEM
S950 ON/OFF
1-623-017-
CHASSIS

CN-27 BOARD (COMPONENT SIDE)


RV807
1-623-010-
Y A/D OUT
CAM GND
R-Y OUT
B-Y OUT
Y MIX
Y BLK
5V
TO VC-22 BOARD

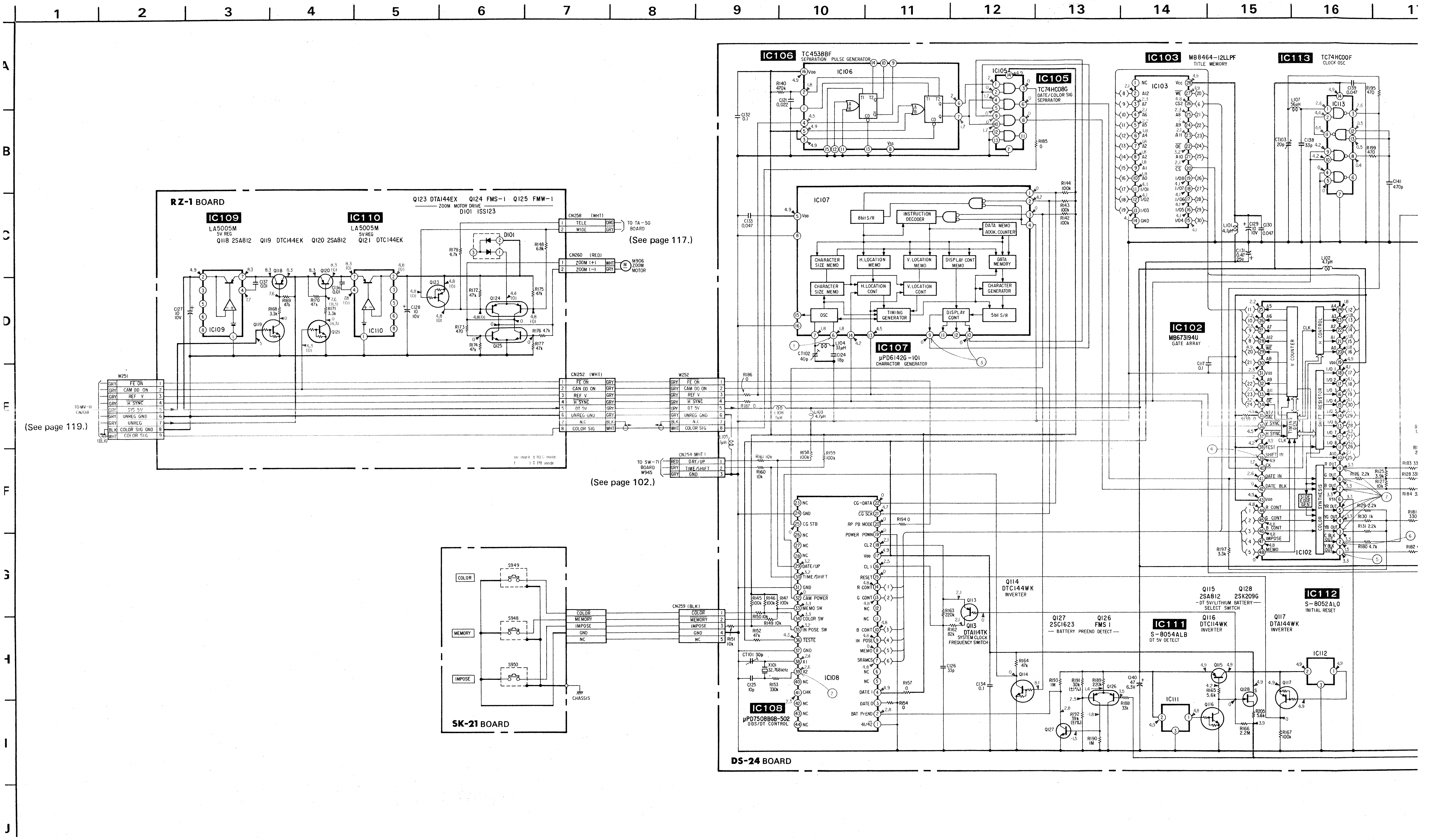
CN-27 BOARD (SOLDER SIDE)

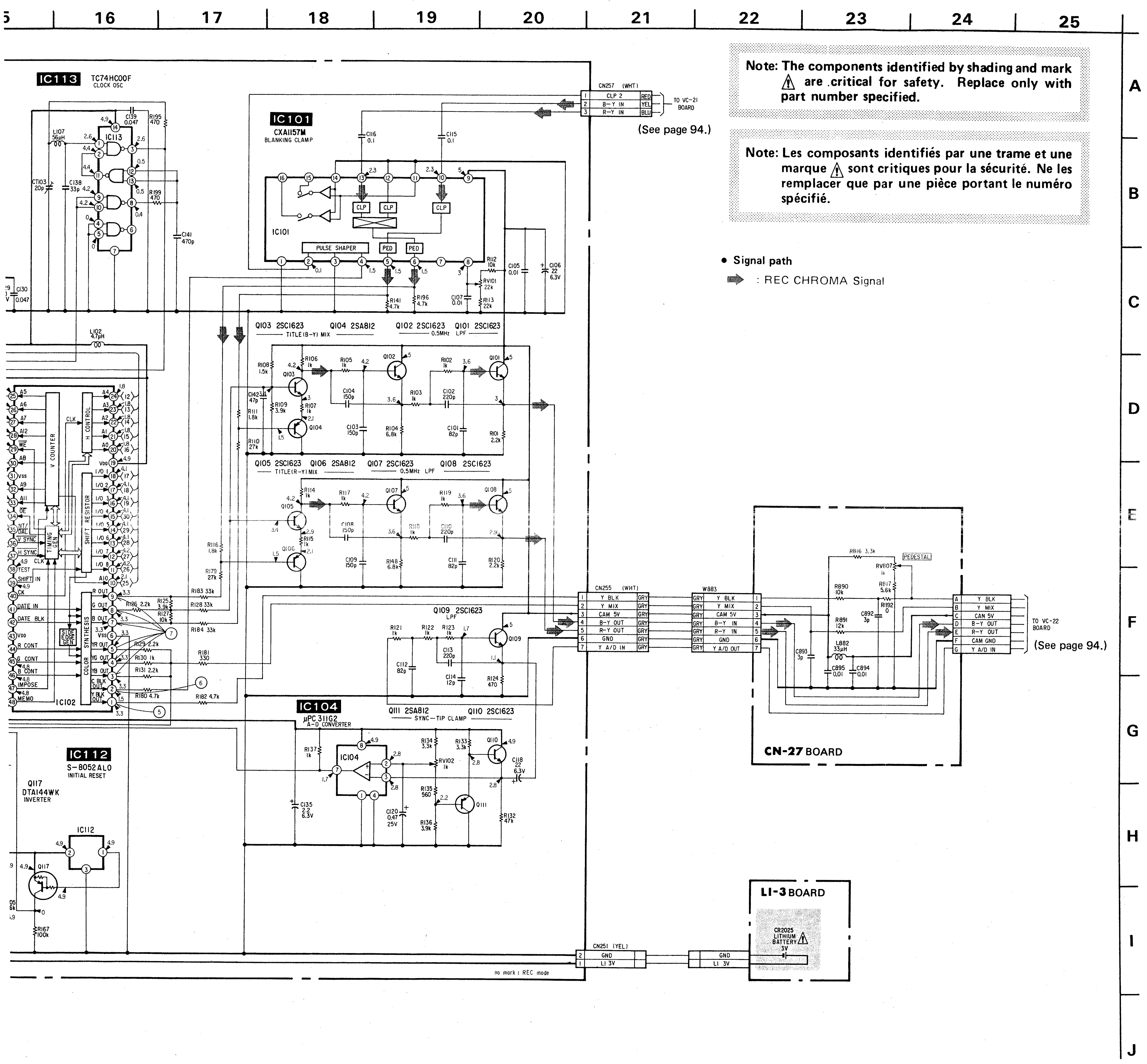


DATA DISPLAY, DIGITAL TITLER

DS-24(DATA DISPLAY, DIGITAL TITLER), RZ-1 (ZOOM DRIVER), CN-27(RELAY), SK-21 (DIGITAL TITLER FUNCTION SWITCH), LI-3(LITHIUM BATTERY HOLDER) SCHEMATIC DIAGRAM

—Ref. No. DS-24, RZ-1, CN-27 and SK-21 BOARDS: 3, 000 Series—


RZ-1 BOARD
IC109 LA5005M 5V REG
IC110 LA5005M 5V REG
Q118 2SA812 Q119 DTC144EK Q120 2SA812 Q121 DTC144EK
Q123 DTA144EX Q124 FMS-1 Q125 FMW-1
ZOOM MOTOR DRIVE
D101 1SS123
CN258 (WHT)
TELE
WIDE
TO TA-50 BOARD
(See page 117.)
CN260 (RED)
ZOOM (+)
ZOOM (−)
M906 ZOOM MOTOR
W251
FE ON
CAM DD ON
REF V
H SYNC
SYS 5V
UNREG GND
UNREG
COLOR SIG GND
COLOR SIG
TO MV-11 CN708
(See page 119.)
CN252 (WHT)
DT 5V
N.C
W252
CN254 (WHT)
DAT/UP
TIME/SHIFT
GND
TO SW-71 BOARD W945
(See page 102.)
SK-21 BOARD
S949
S948
S950
COLOR
MEMORY
IMPOSE
NC
CHASSIS
CN259 (BLK)
DS-24 BOARD
IC106 TC4538BF SEPARATION PULSE GENERATOR
IC105 TC74HC08G DATE/COLOR SIG SEPARATOR
IC103 MB8464-12LLPF TITLE MEMORY
IC113 TC74HC00F CLOCK OSC
IC107 μPD6142G-101 CHARACTOR GENERATOR
8bit S/R
INSTRUCTION DECODER
DATA MEMO ADDR. COUNTER
CHARACTER SIZE MEMO
H.LOCATION MEMO
V.LOCATION MEMO
DISPLAY CONT MEMO
DATA MEMORY
H.LOCATION CONT
V.LOCATION CONT
CHARACTER GENERATOR
OSC
TIMING GENERATOR
DISPLAY CONT
5bit S/R
IC102 MB673194U GATE ARRAY
V COUNTER
H CONTROL
SHIFT RESISTOR
COLOR SYNTHESIS
IC108 μPD7508BGB-502 DDS/DT CONTROL
X101 32.768kHz
Q113 DTA114TK SYSTEM CLOCK FREQUENCY SWITCH
Q114 DTC144WK INVERTER
Q127 2SC1623 Q126 FMS 1 — BATTERY PREEND DETECT —
IC111 S-8054ALB DT 5V DETECT
Q115 2SA812 Q128 2SK209G — DT 5V/LITHIUM BATTERY— SELECT SWITCH
Q116 DTC114WK INVERTER
Q117 DTA144WK INVERTER
IC112 S-8052ALO INITIAL RESET
no mark : REC mode
( ) : PB mode


16
17
18
19
20
21
22
23
24
25
A
B
C
D
E
F
G
H
I
J
IC113 TC74HC00F CLOCK OSC
IC101 CXA1157M BLANKING CLAMP
PULSE SHAPER
CLP
PED
Q103 2SC1623 Q104 2SA812 TITLE(B-Y)MIX
Q102 2SC1623 Q101 2SC1623 0.5MHz LPF
Q105 2SC1623 Q106 2SA812 TITLE(R-Y)MIX
Q107 2SC1623 Q108 2SC1623 0.5MHz LPF
Q109 2SC1623 LPF
IC104 μPC3116 2 A-D CONVERTER
Q111 2SA812 Q110 2SC1623 SYNC-TIP CLAMP
IC112 S-8052ALO INITIAL RESET
Q117 DTA144WK INVERTER
IC102
V COUNTER
H CONTROL
SHIFT RESISTOR
TIMING GEN
COLOR SYNTHESIS
SIDE EDGE GEN
CN257 (WHT)
CLP 2
B-Y IN
R-Y IN
TO VC-21 BOARD
(See page 94.)
CN255 (WHT)
Y BLK
Y MIX
CAM 5V
B-Y OUT
R-Y OUT
GND
Y A/D IN
W883
CN-27 BOARD
PEDESTAL
TO VC-22 BOARD
(See page 94.)
CN251 (YEL)
GND
LI 3V
LI-3 BOARD
CR2025 LITHIUM BATTERY 3V
no mark : REC mode

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

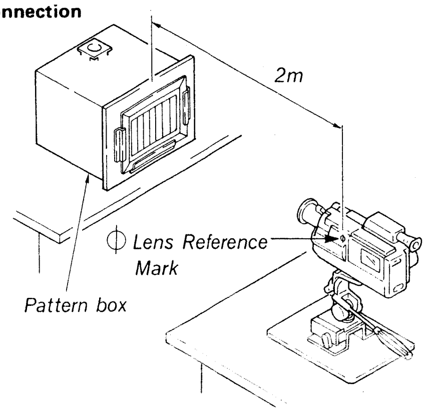
- **Signal path**

➡ : REC CHROMA Signal

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- ——— : B+ bus.
- ▭ : adjustment for repair.
- Measure the voltage and waveform of the DS-24 board by superimposing and turning the screen totally white.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

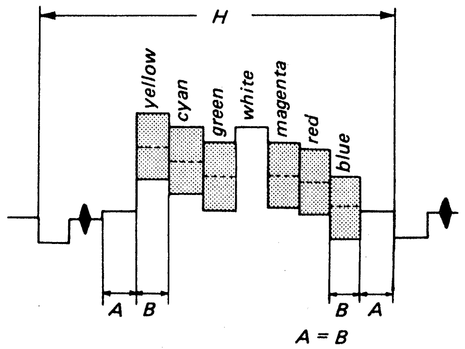

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

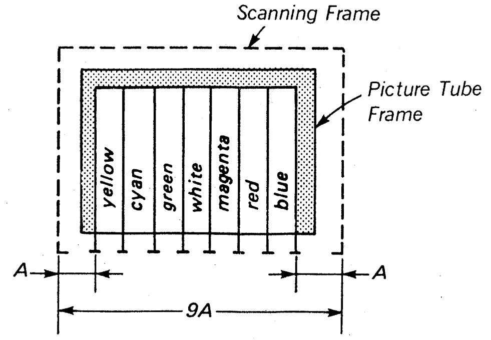
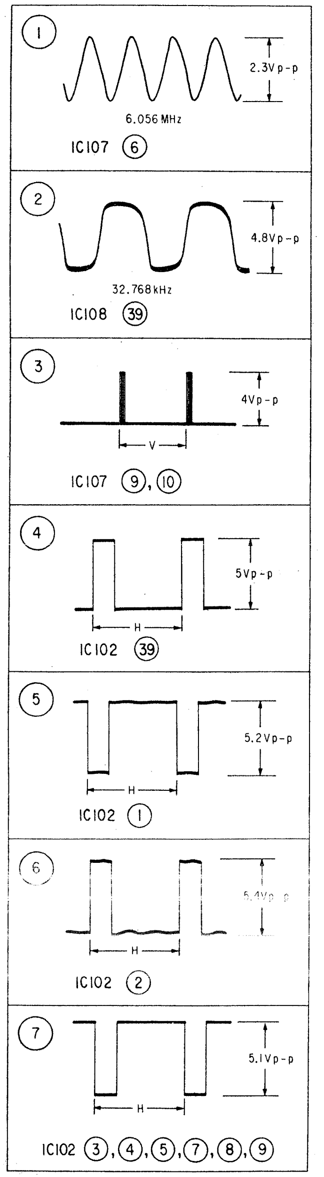

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

DS - 24 BOARD


①
2.3Vp-p
6.056 MHz
IC107 ⑥
②
4.8Vp-p
32.768kHz
IC108 (39)
③
4Vp-p
V
IC107 ⑨, ⑩
④
5Vp-p
H
IC102 (39)
⑤
5.2Vp-p
H
IC102 ①
⑥
5.4Vp-p
H
IC102 ②
⑦
5.1Vp-p
H
IC102 ③, ④, ⑤, ⑦, ⑧, ⑨

MV-11(VIDEO SIGNAL PROCESS), MR-8(REC/PB AMP), TA-50(RELAY TERMINAL), RC-21(START/STOP, CAMERA ON SWITCH), FH-14(POWER), FP-49(OUTPUT JACK) PRINTED WIRING BOARDS

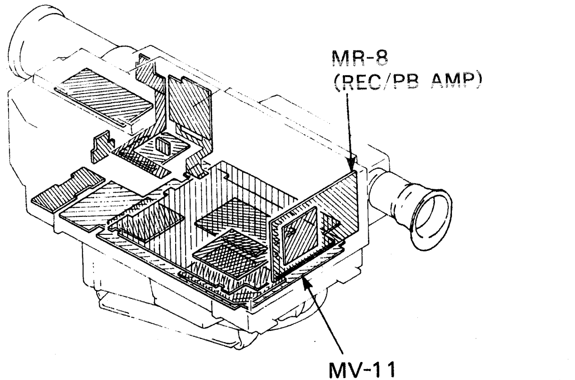
—Ref. No. MV-11, MR-8, FP-49, RC-21, FH-14 and TA-50 BOARDS: 4,000 Series—

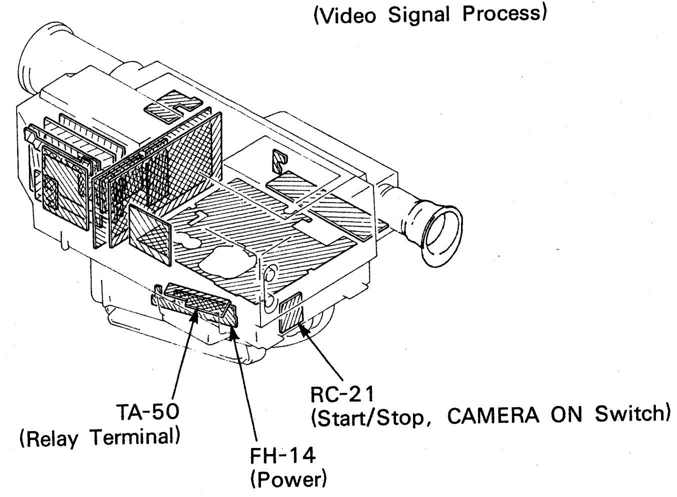
ote:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▓ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.
- ▒ : B+ pattern from the side which enables seeing.
- **Digital transistor (MV-11: Q201, Q202, Q203, Q206, Q207, Q211, Q217, Q220, Q224, Q227, Q652, Q654, MR-8: Q151) transistor with resistor.**
- **Refer to the MV-11 and MR-8 boards schmatic diagram for digital transistor.**

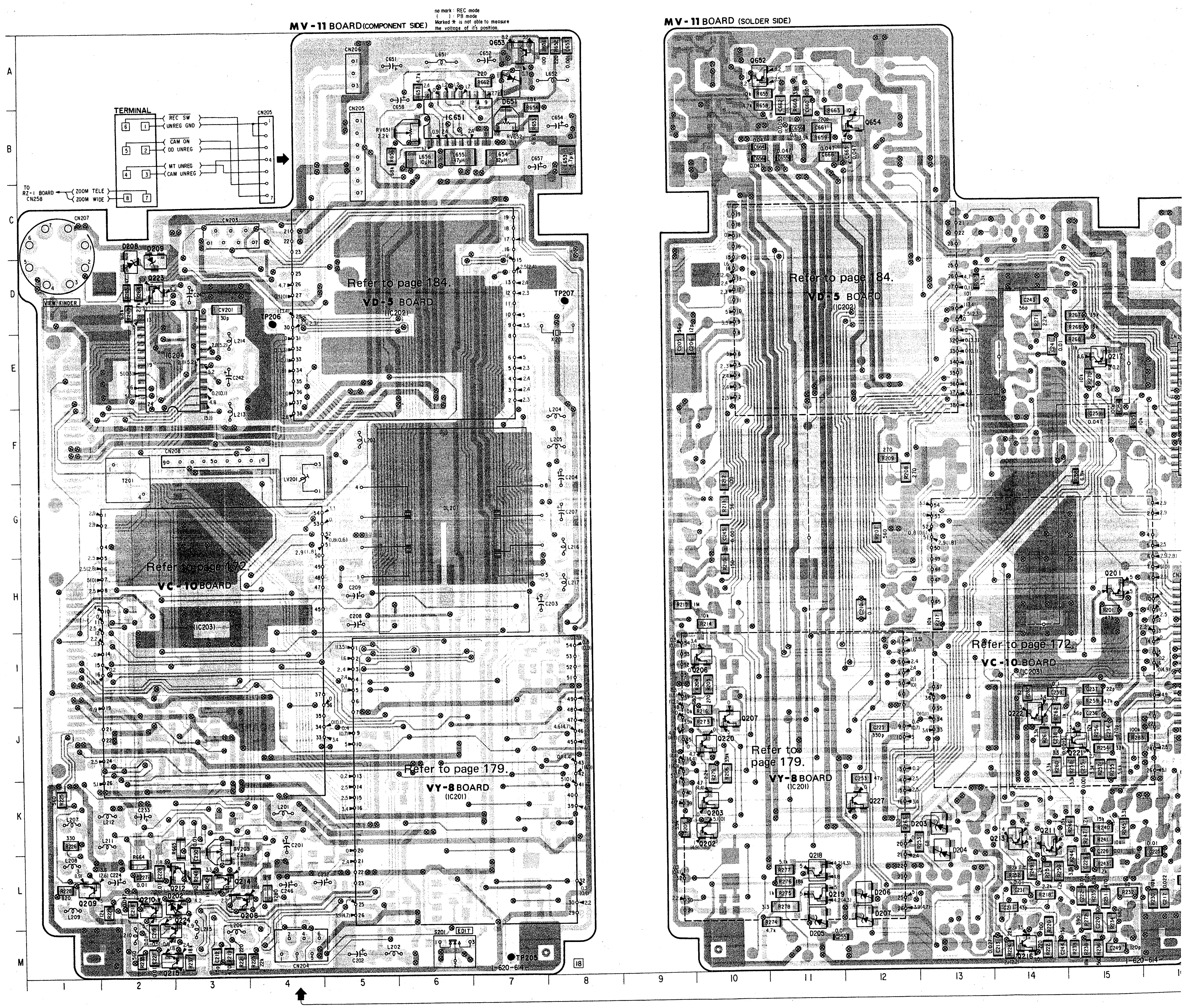
Caution:	
Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

When indicating parts by reference number, please include the board name.

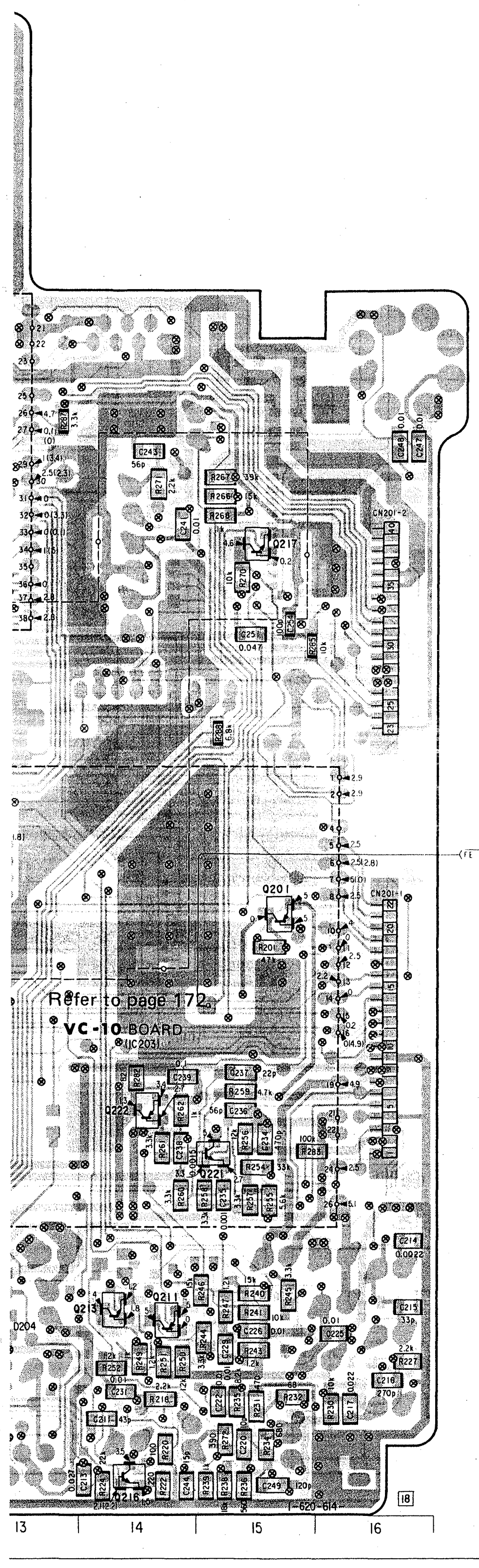

MR-8
(REC/PB AMP)
MV-11
(Video Signal Process)

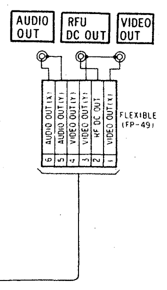

TA-50
(Relay Terminal)
FH-14
(Power)
RC-21
(Start/Stop, CAMERA ON Switch)

CN201	E-16
CN204	M-4
CN205	B-5
CN206	A-5
CN207	C-1
D301	J-15
D302	I-15
D502	D-16
D504	D-16
IC301	G-19
IC303	I-20
IC304	I-20
IC502	F-14
IC503	E-19
IC504	E-15
IC505	E-16
IC506	E-17
IC507	C-20
IC508	B-15
IC509	C-15
IC510	F-16
Q301	H-15
Q302	H-14
Q303	H-14
Q306	J-15
Q309	H-18
Q311	I-19
Q312	G-16
Q314	G-16
Q315	I-19
Q316	I-19
Q317	I-18
Q318	I-18
Q319	I-15
Q320	I-15
Q324	B-19
Q326	I-18
Q327	I-18
Q504	B-17
Q505	B-17
Q506	A-17
Q507	C-17
Q508	B-15
Q509	B-15
Q510	B-15
Q513	E-18
Q515	D-18
Q517	E-18
Q519	E-18
Q521	D-18
Q528	F-15
Q529	F-15
Q530	F-15
Q531	F-17
Q532	F-17


no mark : REC mode
( ) : PB mode
Marked * is not able to measure the voltage of it's position.
MV-11 BOARD (COMPONENT SIDE)
MV-11 BOARD (SOLDER SIDE)
TERMINAL
REC SW
UNREG GND
CAM ON
DD UNREG
MT UNREG
CAM UNREG
CN205
TO RZ-1 BOARD CN258
ZOOM TELE
ZOOM WIDE
CN206
CN207
CN203
VIEW FINDER
TP206
TP207
Refer to page 184.
VD-5 BOARD
(IC202)
Refer to page 172.
VC-10 BOARD
(IC203)
Refer to page 179.
VY-8 BOARD
(IC201)
CN208
T201
LV201
DL201
CN204
S201
EDIT
TP205
1-620-614-
A
B
C
D
E
F
G
H
I
J
K
L
M
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

T JACK) PRINTED WIRING BOARDS

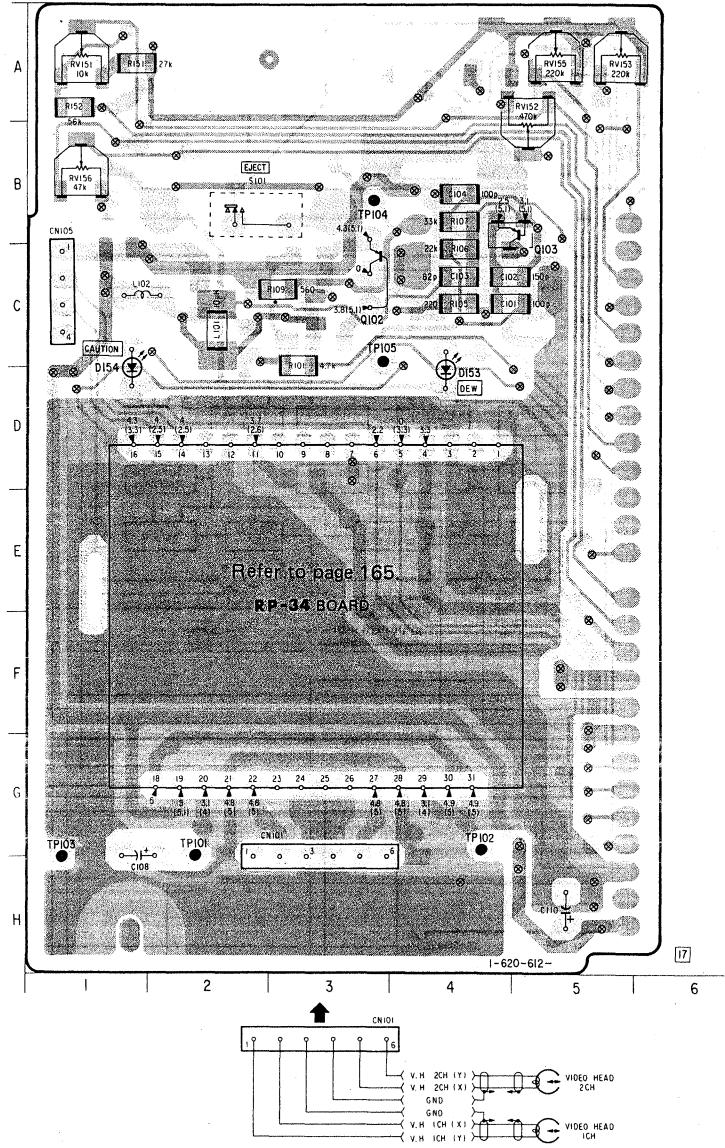

Refer to page 172.
VC-10 BOARD
(IC203)
Q201
Q211
Q213
Q216
Q217
Q221
Q222
CN201
CN202
(FE ON) TO SS-70 BOARD
1-620-614-
18
13
14
15
16


AUDIO OUT
RFU DC OUT
VIDEO OUT
FLEXIBLE (FP-45)

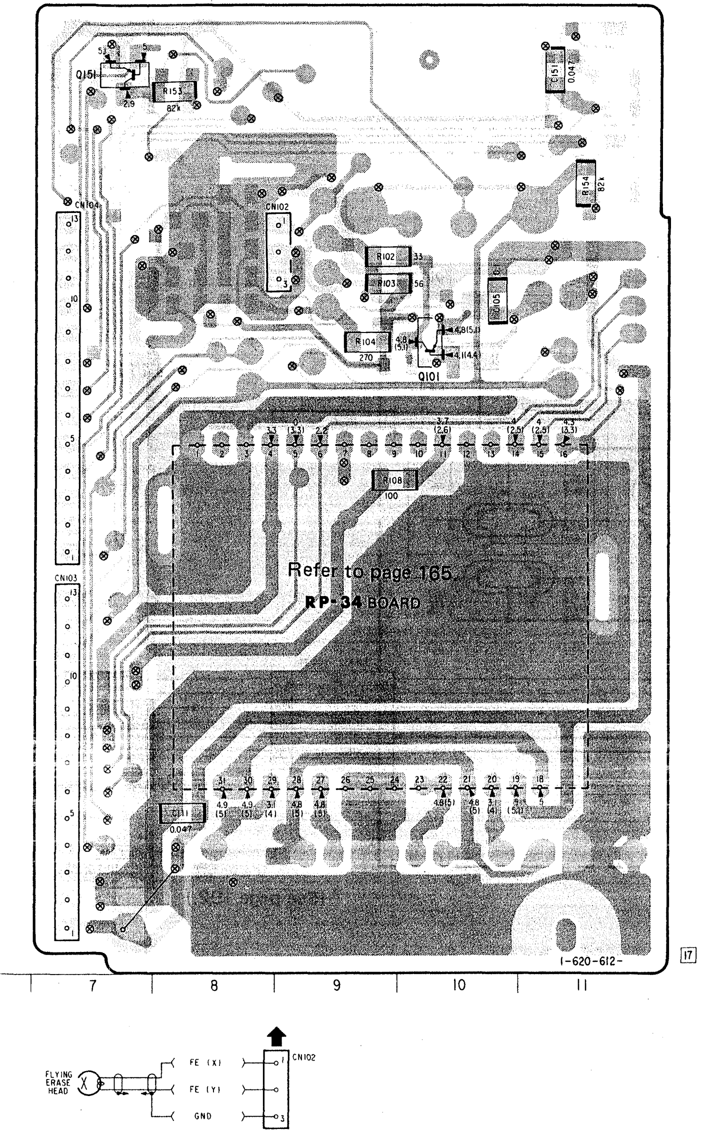
CN101	G-3
CN102	B-9
CN103	E-7
CN104	B-7
CN105	C-1
D153	D-4
D154	D-1
Q101	C-10
Q102	C-3
Q103	B-5
Q151	A-7
RV151	A-1
RV152	A-5
RV153	A-5
RV155	A-5
RV156	B-1
TP101	H-2
TP102	G-4
TP103	H-1
TP104	B-3
TP105	C-3

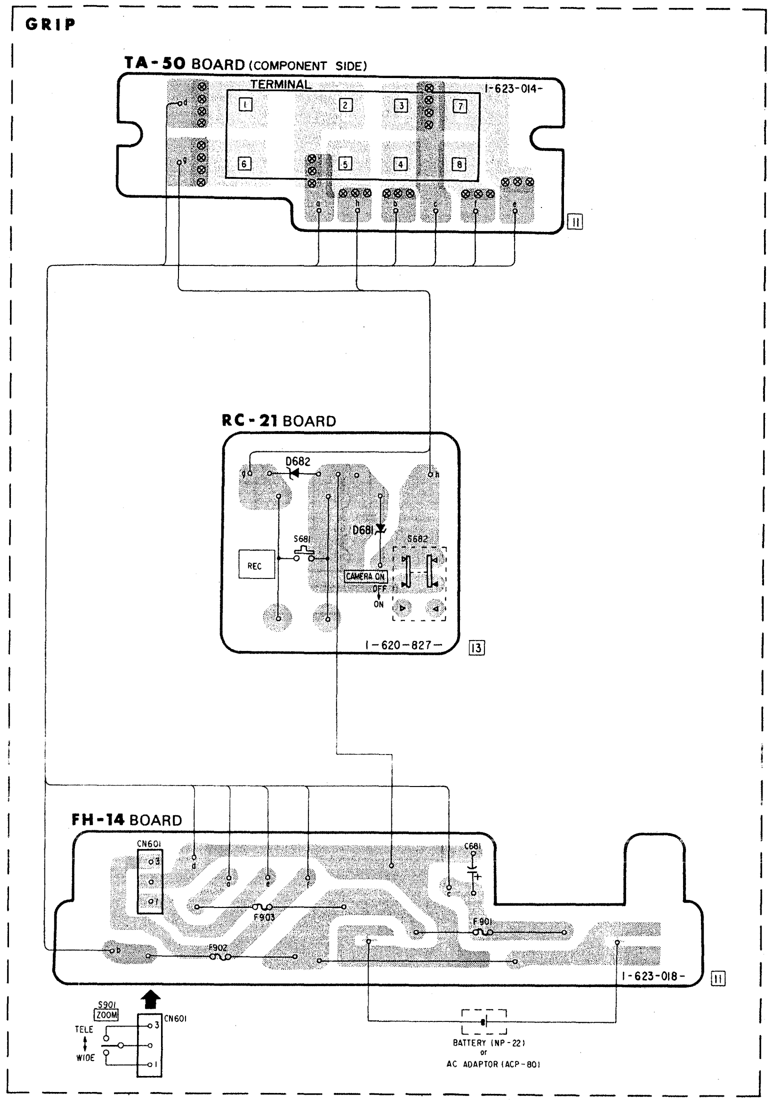
MR-8 BOARD (COMPONENT SIDE)

no mark : REC mode
( ) : PB mode


A
B
C
D
E
F
G
H
1
2
3
4
5
6
RV151 10k
R151 27k
R152 56k
RV156 47k
RV152 470k
RV155 220k
RV153 220k
EJECT S101
TP104
Q102
Q103
CN105
L102
L101
R109 560
R101 4.7k
CAUTION
D154
D153 DEW
TP105
Refer to page 165.
RP-34 BOARD
TP103
TP101
TP102
C108
C110
CN101
1-620-612-
17
VIDEO HEAD 2CH
VIDEO HEAD 1CH
V.H 2CH (Y)
V.H 2CH (X)
GND
GND
V.H 1CH (X)
V.H 1CH (Y)

MR-8 BOARD (SOLDER SIDE)

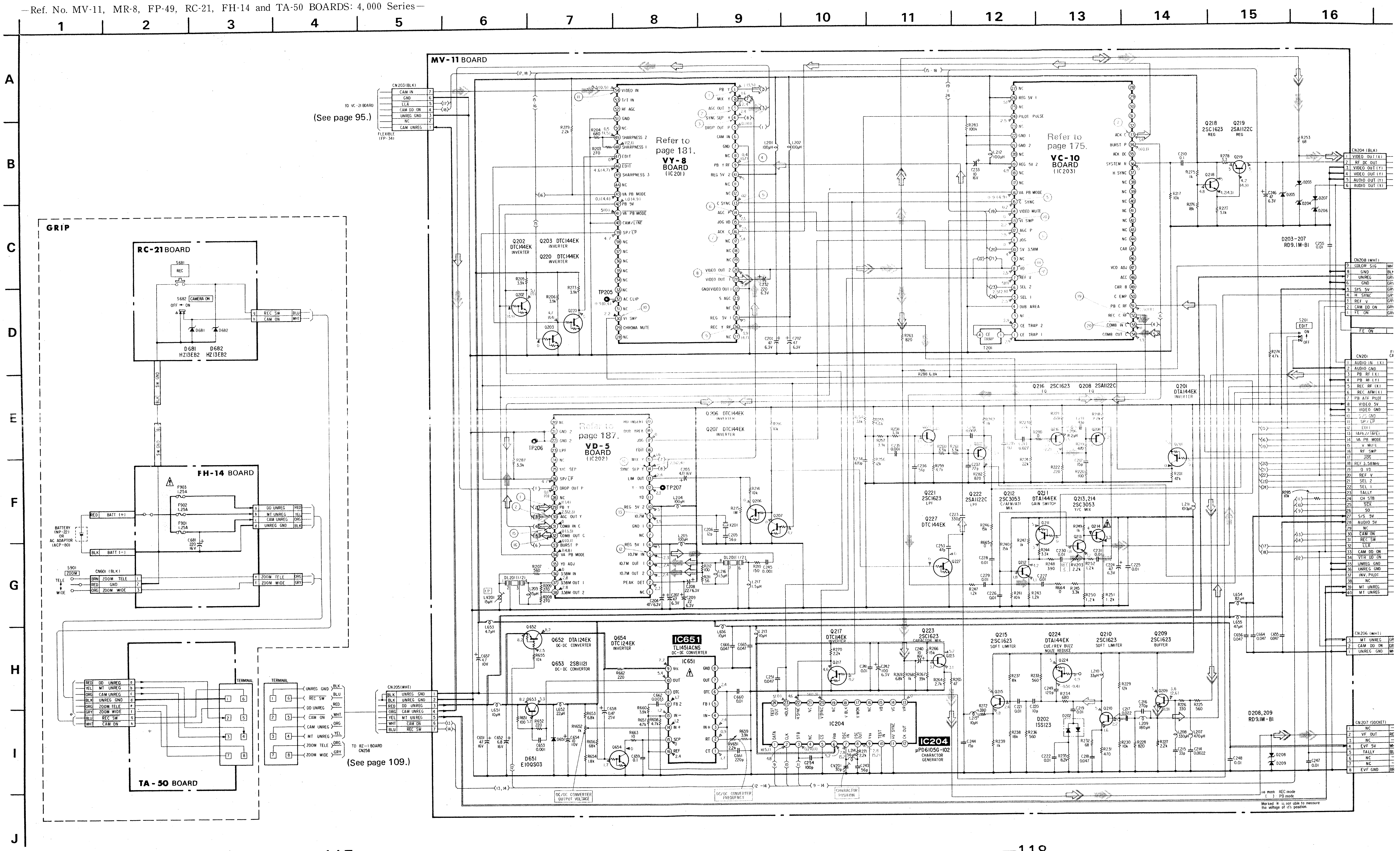

7
8
9
10
11
Q151
R153 82k
R154 82k
CN104
CN102
CN103
R102
R103
R104 270
R105
R108 100
Q101
C111 0.047
Refer to page 165.
RP-34 BOARD
1-620-612-
17
FLYING ERASE HEAD
FE (X)
FE (Y)
GND
CN102


GRIP
TA-50 BOARD (COMPONENT SIDE)
TERMINAL
1-623-014-
11
RC-21 BOARD
D682
D681
S681
S682
REC
CAMERA ON
OFF
ON
1-620-827-
13
FH-14 BOARD
CN601
C681
F901
F902
F903
1-623-018-
11
S901 ZOOM
TELE
WIDE
BATTERY (NP-22) or AC ADAPTOR (ACP-80)

VIDEO, POWER VIDEO, POWER

MV-11(VIDEO SIGNAL PROCESS), MR-8(REC/PB AMP), TA-50(RELAY TERMINAL), RC-21(START/STOP, CAMERA ON SWITCH), FH-14(POWER), FP-49(OUTPUT JACK) SCHEMATIC DIAGRAM

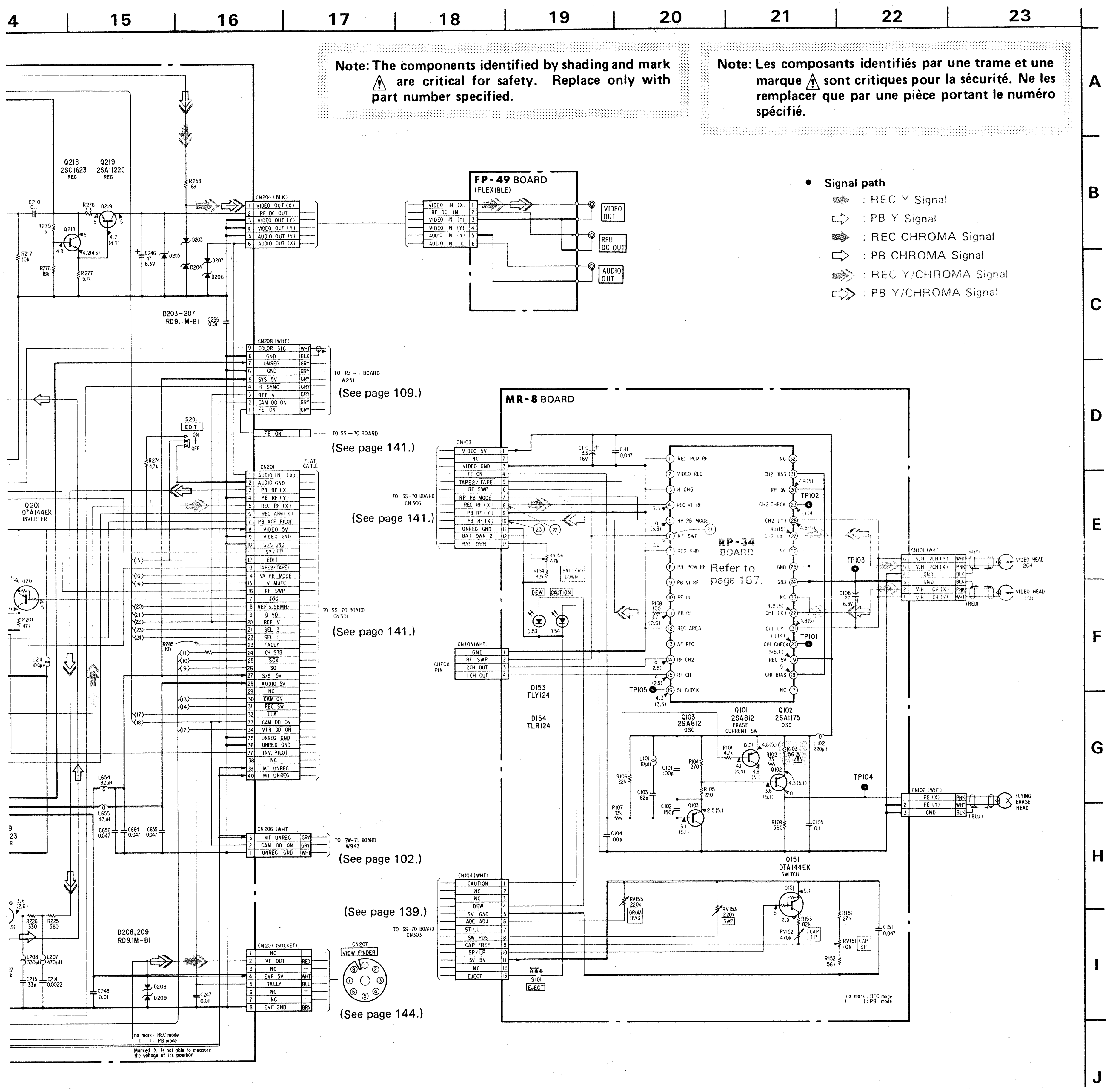
—Ref. No. MV-11, MR-8, FP-49, RC-21, FH-14 and TA-50 BOARDS: 4,000 Series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
MV-11 BOARD
GRIP
RC-21 BOARD
FH-14 BOARD
TA-50 BOARD
CN203 (BLK)
TO VC-21 BOARD
(See page 95.)
FLEXIBLE (FP-34)
Refer to page 181.
VY-8 BOARD (IC201)
Refer to page 175.
VC-10 BOARD (IC203)
Refer to page 187.
VD-5 BOARD (IC202)
S681 REC
S682 CAMERA ON
D681 D682 HZ13EB2 HZ13EB2
BATTERY (NP-22) OR AC ADAPTOR (ACP-80)
F903 1.25A
F902 1.25A
F901 1.25A
S901 ZOOM TELE WIDE
CN601 (BLK)
TERMINAL
TO RZ-1 BOARD CN258
(See page 109.)
CN205 (WHT)
IC651 TL1451ACNS DC-DC CONVERTER
IC204 μPD6105G-102 CHARACTOR GENERATOR
Q652 DTA124EK DC-DC CONVERTER
Q653 2SB1121 DC-DC CONVERTER
Q654 DTC124EK INVERTER
D651 E10QS03
Q202 DTC144EK INVERTER
Q203 DTC144EK INVERTER
Q220 DTC144EK INVERTER
Q206 DTC144EK INVERTER
Q207 DTC144EK INVERTER
Q218 2SC1623 REG
Q219 2SA1122C REG
Q216 2SC1623 EQ
Q208 2SA1122C EQ
Q201 DTA144EK INVERTER
Q221 2SC1623 LPF
Q222 2SA1122C LPF
Q212 2SC3053 C AFM/ATF MIX
Q211 DTA144EK GAIN SWITCH
Q213, 214 2SC3053 Y/C MIX
Q227 DTC144EK
Q217 DTC144EK INVERTER
Q223 2SC1623 CHARACTOR MIX
Q215 2SC1623 SOFT LIMITER
Q224 DTA144EK CUE/REV BUZZ NOISE REDUCE
Q210 2SC1623 SOFT LIMITER
Q209 2SC1623 BUFFER
D202 1SS123
D203-207 RD9.1M-B1
D208, 209 RD9.1M-B1
CN204 (BLK)
CN208 (WHT)
CN201
CN206 (WHT)
CN207 (SOCKET)
S201 EDIT
TP205
TP206
TP207
DC/DC CONVERTER OUTPUT VOLTAGE
DC/DC CONVERTER FREQUENCY
CHARACTOR POSITION
( ) : REC mode
[ ] : PB mode
Marked * is not able to measure the voltage of it's position.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

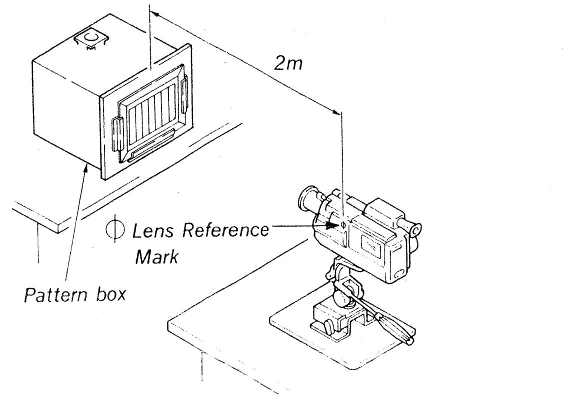
- **Signal path**
  - ▨ : REC Y Signal
  - ⇨ : PB Y Signal
  - ▨ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ▨ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal


4
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
Q218 2SC1623 REG
Q219 2SA1122C REG
D203-207 RD9.1M-B1
CN204 (BLK)
VIDEO OUT (X)
RF DC OUT
VIDEO OUT (Y)
VIDEO OUT (Y)
AUDIO OUT (Y)
AUDIO OUT (X)
FP-49 BOARD (FLEXIBLE)
VIDEO OUT
RFU DC OUT
AUDIO OUT
CN208 (WHT)
TO RZ-1 BOARD W251
(See page 109.)
S201 EDIT
TO SS-70 BOARD
(See page 141.)
CN201
FLAT CABLE
Q201 DTA144EK INVERTER
TO SS-70 BOARD CN306
(See page 141.)
TO SS-70 BOARD CN301
(See page 141.)
CN206 (WHT)
TO SW-71 BOARD W943
(See page 102.)
D208,209 RD9.1M-B1
CN207 (SOCKET)
CN207 VIEW FINDER
(See page 144.)
TO SS-70 BOARD CN303
(See page 139.)
MR-8 BOARD
CN103
CN105 (WHT)
CHECK PIN
CN104 (WHT)
RP-34 BOARD
Refer to page 167.
TP102
TP101
TP103
TP104
TP105
D153 TLY124
D154 TLR124
DEW
CAUTION
BATTERY DOWN
Q103 2SA812 OSC
Q101 2SA812 ERASE CURRENT SW
Q102 2SA1175 OSC
Q151 DTA144EK SWITCH
CN101 (WHT)
VIDEO HEAD 2CH
VIDEO HEAD 1CH
CN102 (WHT)
FLYING ERASE HEAD
RV155 DRUM BIAS
RV153 SWP
RV152 CAP LP
RV151 CAP SP
S101 EJECT
no mark : REC mode
( ) : PB mode
Marked ✱ is not able to measure the voltage of it's position.

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- ─── : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

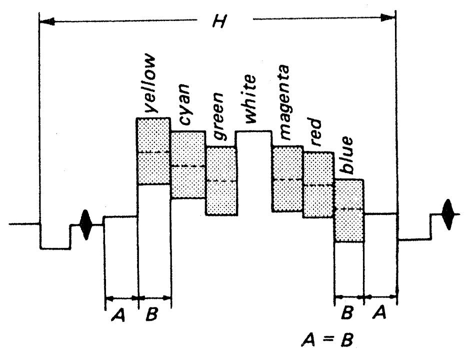

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

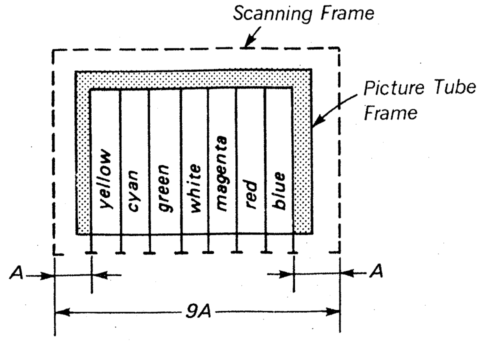
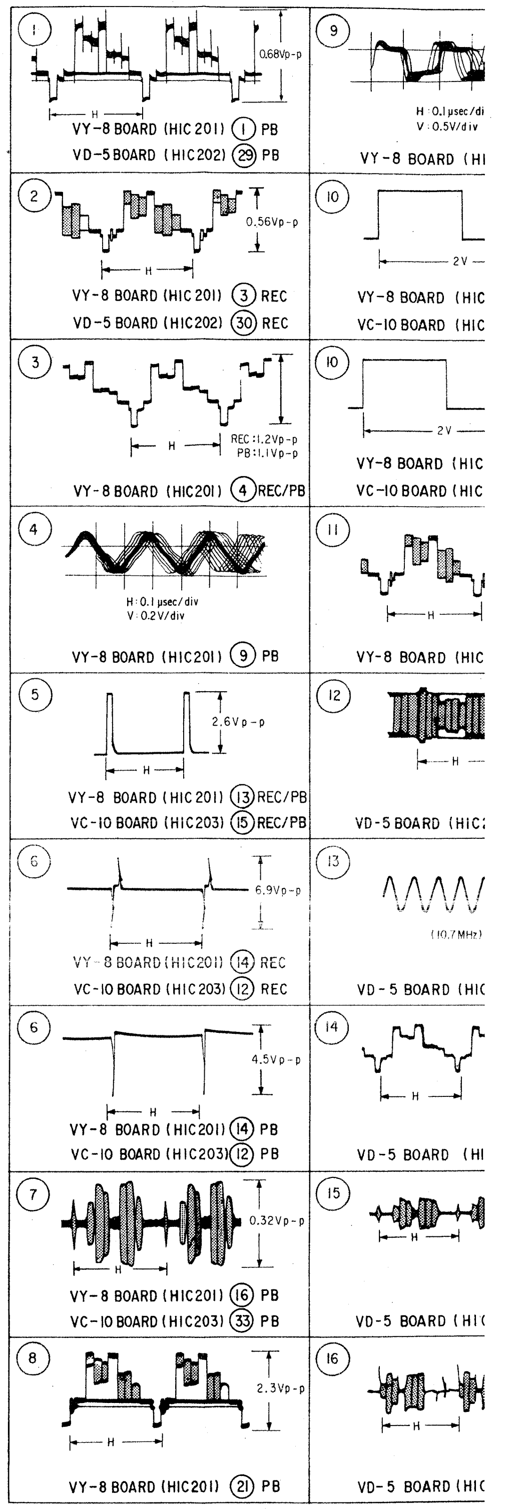

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

MV-11 BOARD

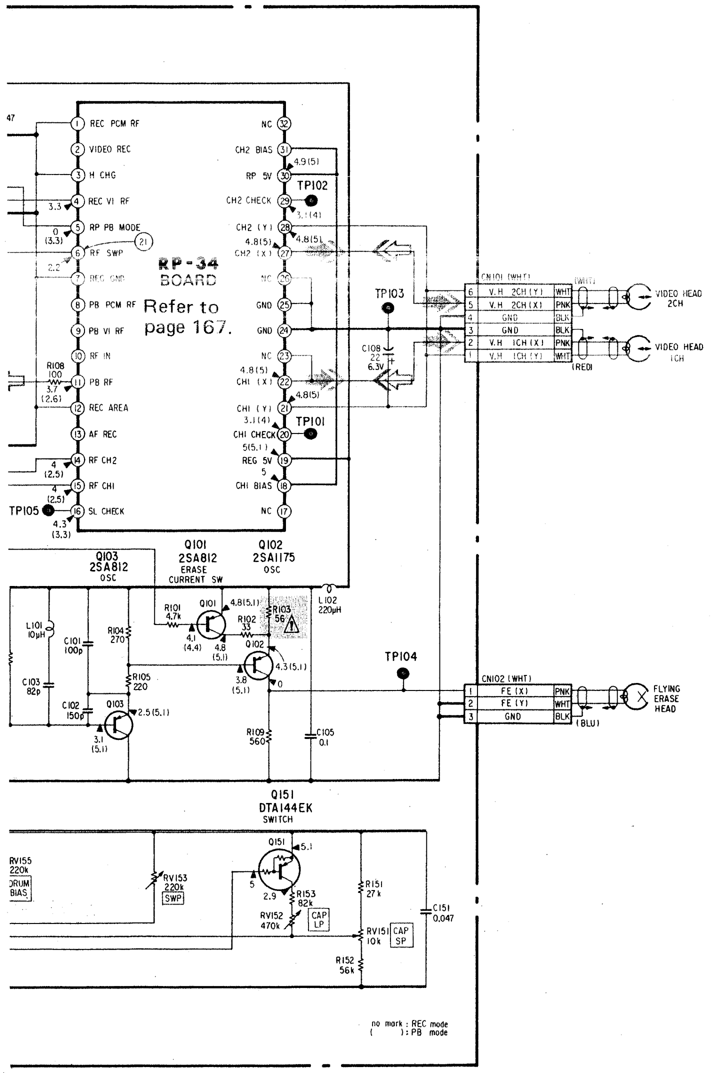

①
0.68Vp-p
H
VY-8 BOARD (HIC201) ① PB
VD-5 BOARD (HIC202) ㉙ PB
②
0.56Vp-p
H
VY-8 BOARD (HIC201) ③ REC
VD-5 BOARD (HIC202) ㉚ REC
③
H
REC:1.2Vp-p
PB:1.1Vp-p
VY-8 BOARD (HIC201) ④ REC/PB
④
H: 0.1 μsec/div
V: 0.2V/div
VY-8 BOARD (HIC201) ⑨ PB
⑤
2.6Vp-p
H
VY-8 BOARD (HIC201) ⑬ REC/PB
VC-10 BOARD (HIC203) ⑮ REC/PB
⑥
6.9Vp-p
H
VY-8 BOARD (HIC201) ⑭ REC
VC-10 BOARD (HIC203) ⑫ REC
⑥
4.5Vp-p
H
VY-8 BOARD (HIC201) ⑭ PB
VC-10 BOARD (HIC203) ⑫ PB
⑦
0.32Vp-p
H
VY-8 BOARD (HIC201) ⑯ PB
VC-10 BOARD (HIC203) ㉝ PB
⑧
2.3Vp-p
H
VY-8 BOARD (HIC201) ㉑ PB
⑨
H: 0.1 μsec/di
V: 0.5V/div
VY-8 BOARD (HI
⑩
2V
VY-8 BOARD (HIC
VC-10 BOARD (HIC
⑩
2V
VY-8 BOARD (HIC
VC-10 BOARD (HIC
⑪
H
VY-8 BOARD (HIC
⑫
H
VD-5 BOARD (HIC
⑬
(10.7MHz)
VD-5 BOARD (HIC
⑭
H
VD-5 BOARD (HI
⑮
H
VD-5 BOARD (HI
⑯
H
VD-5 BOARD (HIC

20 | 21 | 22 | 23

d mark
ly with

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- **Signal path**
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal

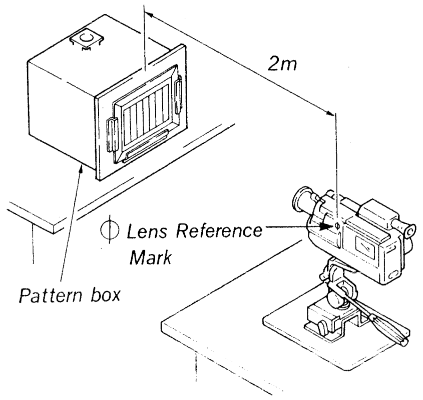

RP-34 BOARD
Refer to page 167.
47
REC PCM RF
VIDEO REC
H CHG
REC VI RF
RP PB MODE
RF SWP
REC GND
PB PCM RF
PB VI RF
RF IN
PB RF
REC AREA
AF REC
RF CH2
RF CH1
SL CHECK
NC
CH2 BIAS
RP 5V
CH2 CHECK
CH2 (Y)
CH2 (X)
GND
CH1 (X)
CH1 (Y)
CH1 CHECK
REG 5V
CH1 BIAS
TP101
TP102
TP103
TP104
TP105
3.3
0 (3.3)
2.2
R108 100
3.7 (2.6)
4 (2.5)
4.3 (3.3)
4.9 (5)
3.1 (4)
4.8 (5)
5 (5.1)
5
C108 22 6.3V
CN101 (WHT)
V.H 2CH (Y)
V.H 2CH (X)
GND
V.H 1CH (X)
V.H 1CH (Y)
WHT
PNK
BLK
(WHT)
(RED)
VIDEO HEAD 2CH
VIDEO HEAD 1CH
Q101 2SA812 ERASE CURRENT SW
Q102 2SA1175 OSC
Q103 2SA812 OSC
L101 10μH
C101 100p
C102 150p
C103 82p
R104 270
R105 220
R101 4.7k
R102 33
R103 56
4.8 (5.1)
4.1 (4.4)
4.8 (5.1)
3.8 (5.1)
4.3 (5.1)
2.5 (5.1)
3.1 (5.1)
L102 220μH
R109 560
C105 0.1
CN102 (WHT)
FE (X)
FE (Y)
GND
(BLU)
FLYING ERASE HEAD
Q151 DTA144EK SWITCH
RV155 220k DRUM BIAS
RV153 220k SWP
5.1
2.9
R153 82k
RV152 470k CAP LP
R151 27k
RV151 10k CAP SP
R152 56k
C151 0.047
no mark : REC mode
( ) : PB mode

A B C D E F G H I J

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▨ : Nonflammable resistor
- ——— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

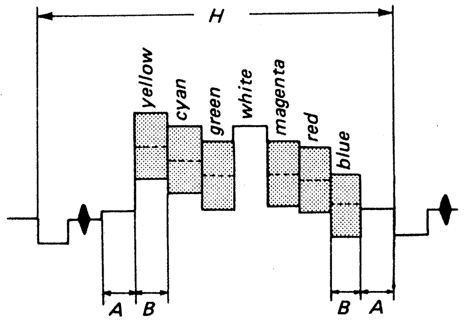

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

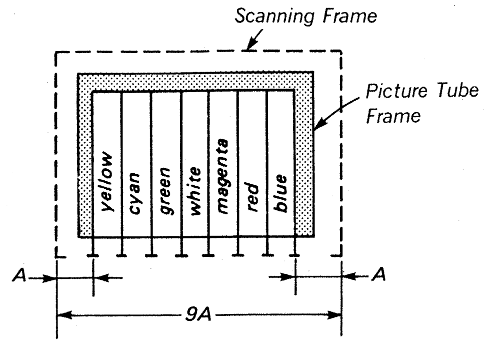
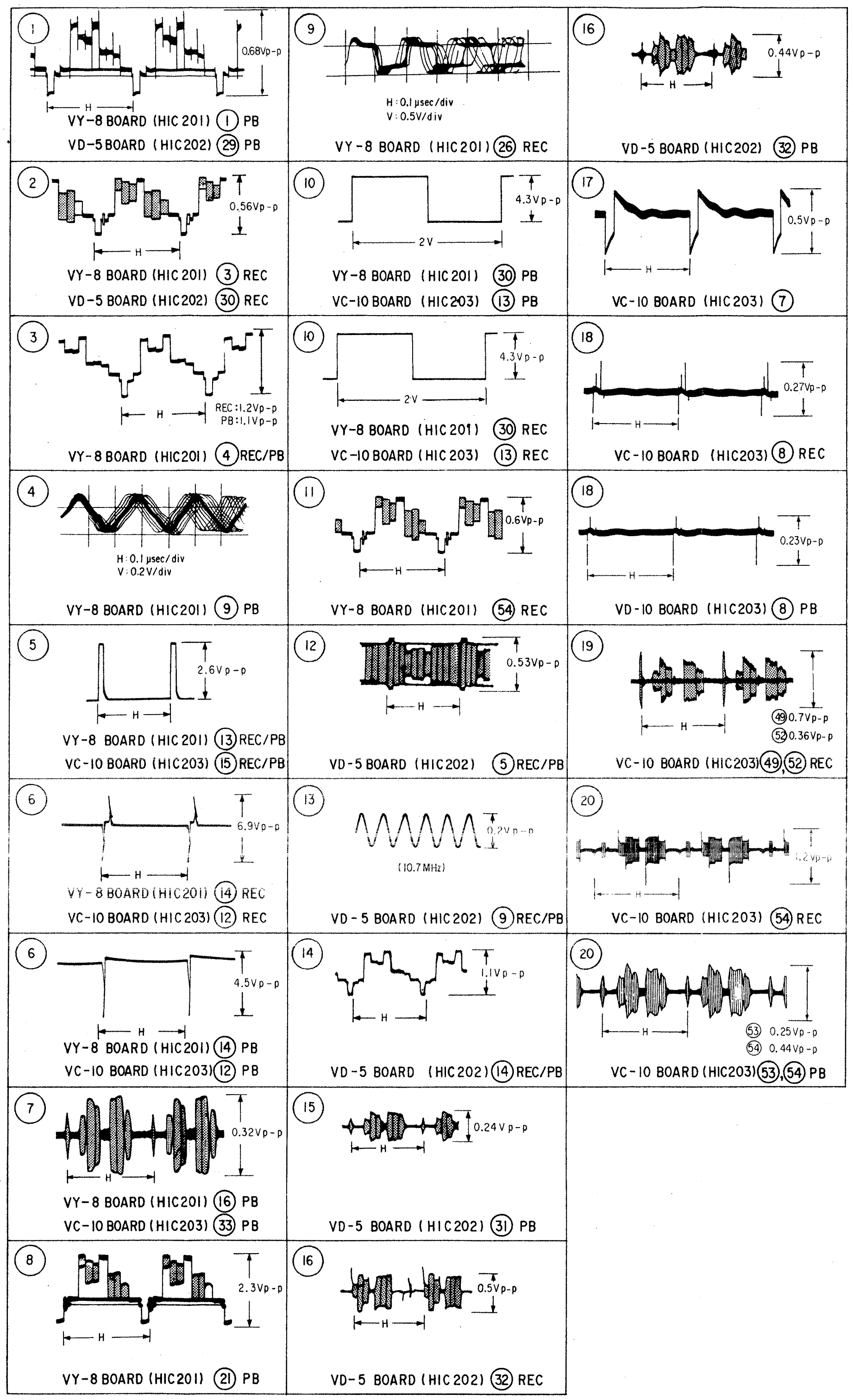
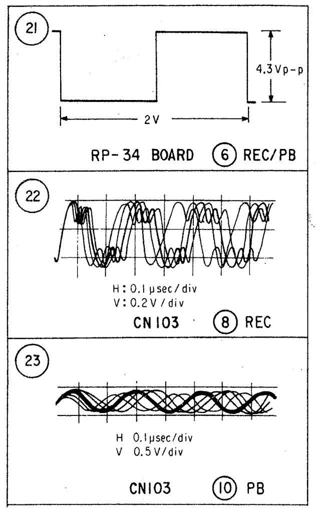

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

MV-11 BOARD



MR-8 BOARD



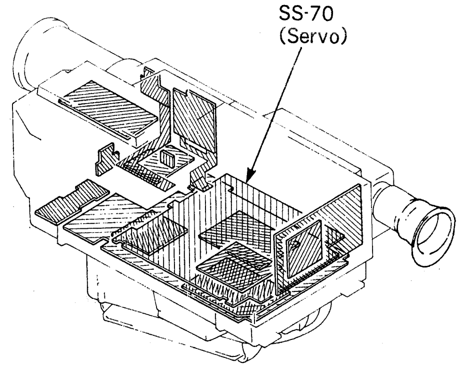
Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▩ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.
- ▒ : B+ pattern from the side which enables seeing.
- Digital transistor (SS-70: Q307, Q309, Q310, Q311, Q317, Q318, Q321, Q322, Q324, Q325, Q328, Q501, Q504, Q506, Q507, Q513, Q514, Q515, Q528, Q529, Q531, Q532) transistor with resistor.
- Refer to the SS-70 board schematic diagram for digital transistor.

Caution:

Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

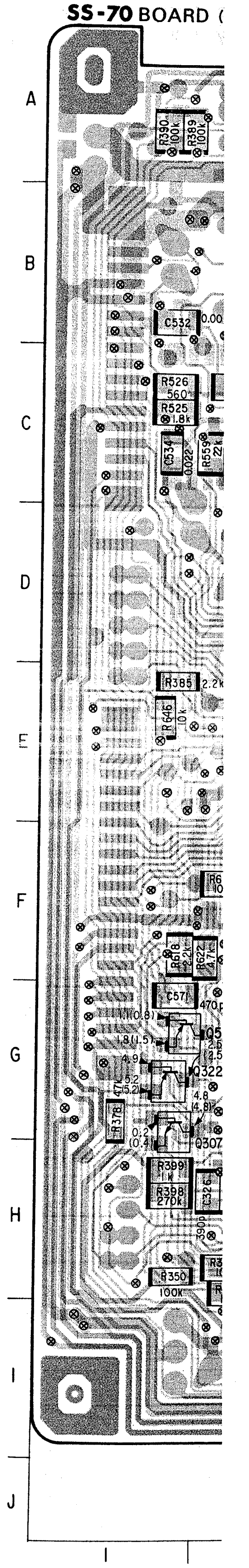
When indicating parts by reference number, please include the board name.



SS-70(SERVO) PRINTED WIRING BOARDS

—Ref. No. SS-70 BOARD: 5, 000 Series—

D305	A-3
D501	E-6
D503	A-7
D505	C-4
D506	C-3
IC302	H-7
IC305	I-7
IC501	E-8
Q307	G-1
Q308	H-2
Q309	I-6
Q310	H-3
Q313	G-6
Q321	G-3
Q322	G-1
Q323	H-6
Q325	A-3
Q328	H-3
Q501	G-6
Q502	G-1
Q503	C-5
Q511	B-8
Q512	C-6
Q514	E-5
Q516	E-4
Q518	E-4
Q520	E-4
Q524	C-3
Q525	C-4
Q526	E-6
Q527	D-8

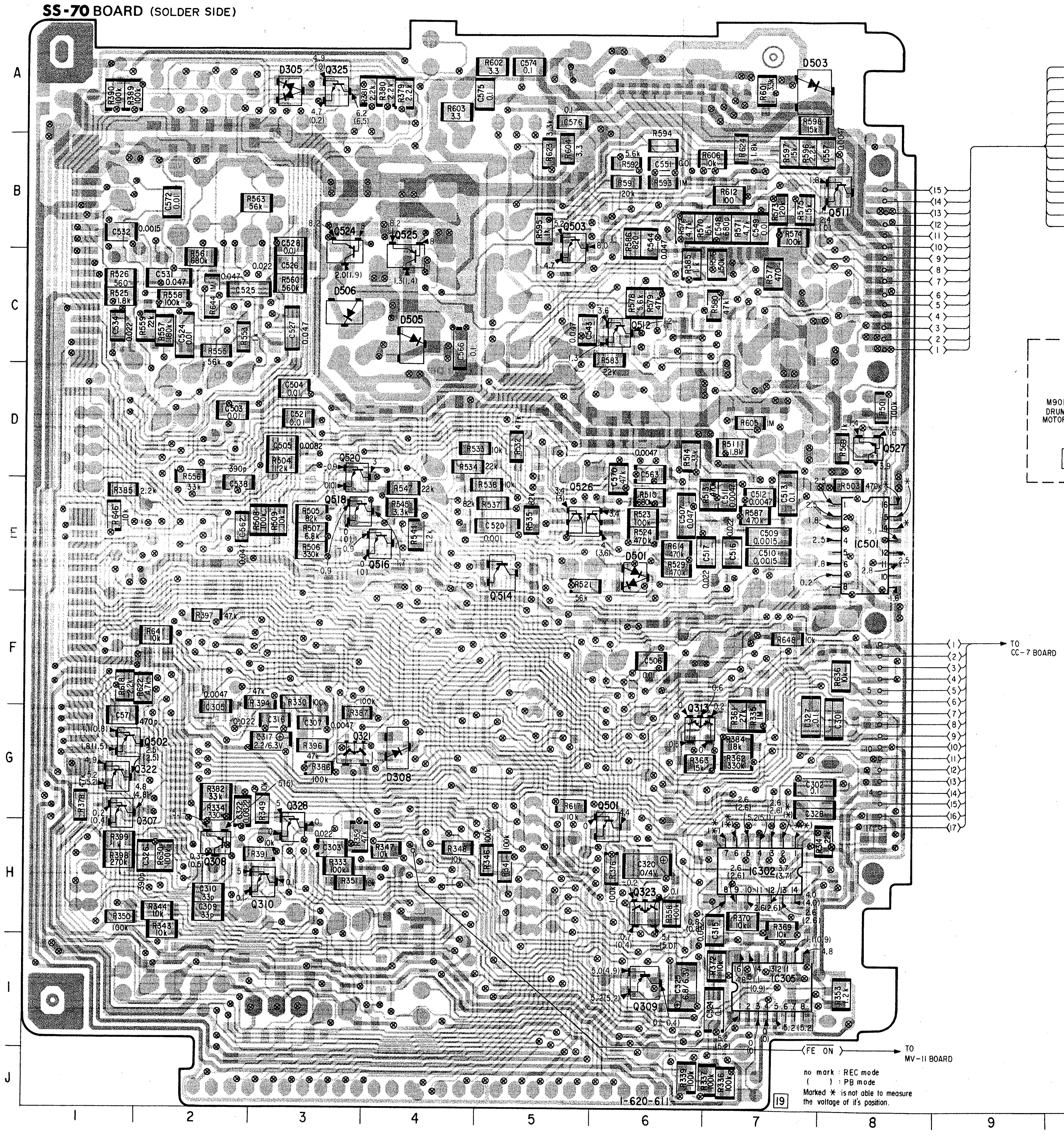


)PRINTED WIRING BOARDS

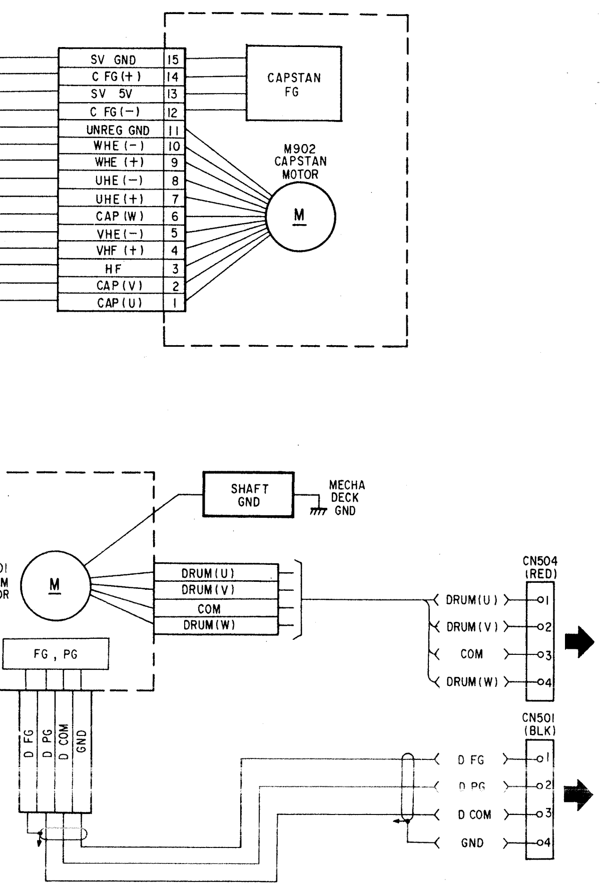
-70 BOARD: 5, 000 Series—

D305	A-3
D501	E-6
D503	A-7
D505	C-4
D506	C-3
IC302	H-7
IC305	I-7
IC501	E-8
Q307	G-1
Q308	H-2
Q309	I-6
Q310	H-3
Q313	G-6
Q321	G-3
Q322	G-1
Q323	H-6
Q325	A-3
Q328	H-3
Q501	G-6
Q502	G-1
Q503	C-5
Q511	B-8
Q512	C-6
Q514	E-5
Q516	E-4
Q518	E-4
Q520	E-4
Q524	C-3
Q525	C-4
Q526	E-6
Q527	D-8

SS-70 BOARD (SOLDER SIDE)

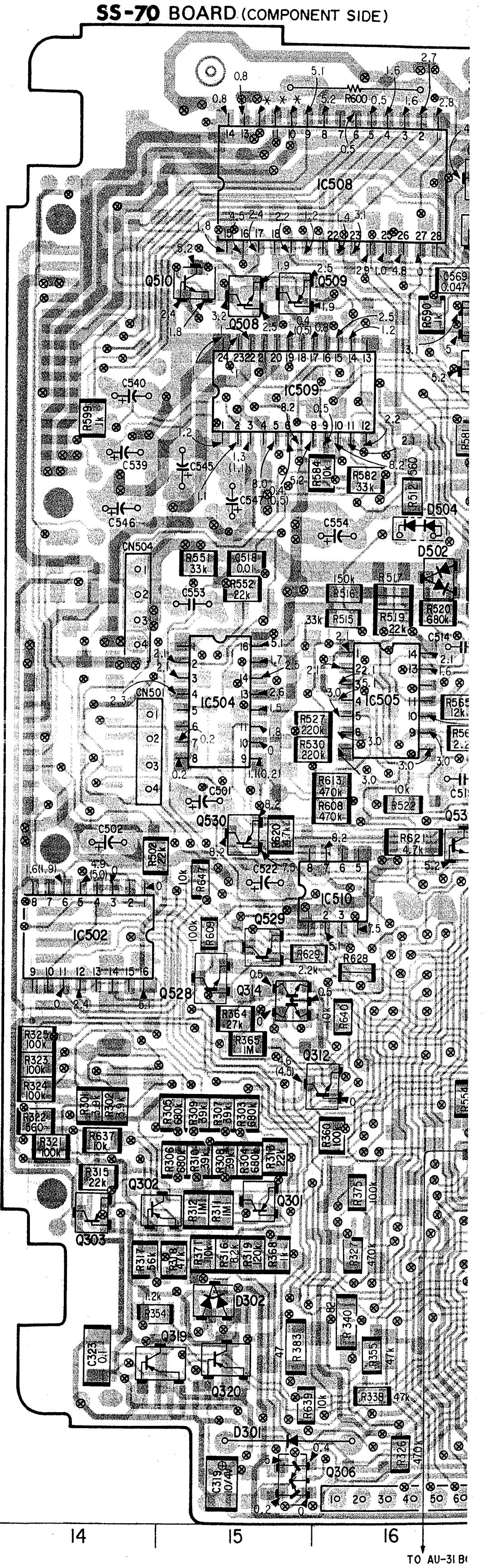

A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
D305
Q325
D503
Q524
Q525
D506
D505
Q503
Q512
Q511
Q527
IC501
Q520
Q518
Q516
Q514
Q526
D501
Q502
Q322
Q307
Q308
Q310
Q328
Q321
D308
Q313
Q501
IC302
Q323
IC305
Q309
TO CC-7 BOARD
FE ON
TO MV-11 BOARD
1-620-611
19

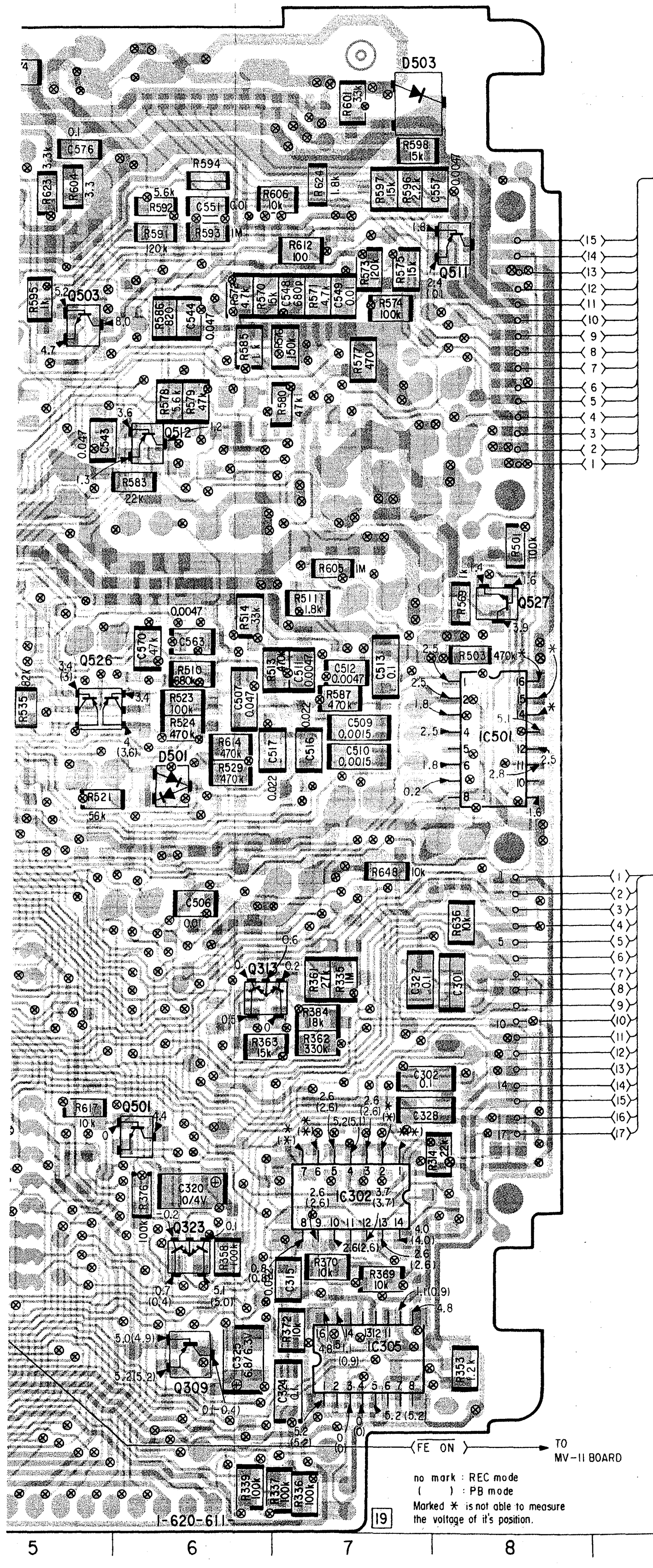
no mark : REC mode
( ) : PB mode
Marked * is not able to measure the voltage of it's position.


SV GND
C FG (+)
SV 5V
C FG (−)
UNREG GND
WHE (−)
WHE (+)
UHE (−)
UHE (+)
CAP (W)
VHE (−)
VHF (+)
HF
CAP (V)
CAP (U)
CAPSTAN FG
M902 CAPSTAN MOTOR
M
M901 DRUM MOTOR
SHAFT GND
MECHA DECK GND
DRUM (U)
DRUM (V)
COM
DRUM (W)
FG, PG
D FG
D PG
D COM
GND
CN504 (RED)
CN501 (BLK)

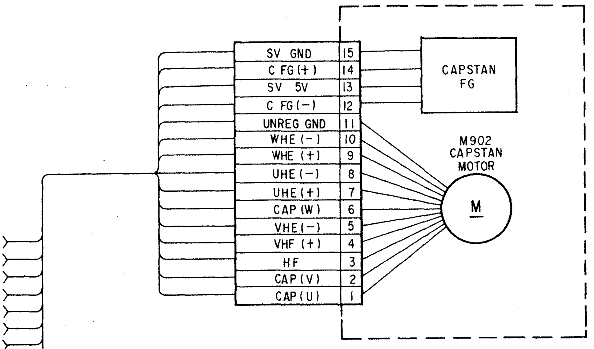
CN303	J-19	Q312	G-16
CN304	A-20	Q314	G-16
CN305	A-18	Q315	I-19
CN307	A-17	Q316	I-19
CN502	H-21	Q317	I-18
CN505	E-21	Q318	I-18
		Q319	I-15
D301	J-15	Q320	I-15
D302	I-15	Q324	B-19
D502	D-16	Q326	I-18
D504	D-16	Q327	I-18
		Q504	B-17
IC301	G-19	Q505	B-17
IC303	I-20	Q506	A-17
IC304	I-20	Q507	C-17
IC502	F-14	Q508	B-15
IC503	E-19	Q509	B-15
IC504	E-15	Q510	B-15
IC505	E-16	Q513	E-18
IC506	E-17	Q515	D-18
IC507	C-20	Q517	E-18
IC508	B-15	Q519	E-18
IC509	C-15	Q521	D-18
IC510	F-16	Q528	F-15
		Q529	F-15
Q301	H-15	Q530	F-15
Q302	H-14	Q531	F-17
Q303	H-14	Q532	F-17
Q306	J-15		
Q309	H-18	RV502	B-20
Q311	I-19		

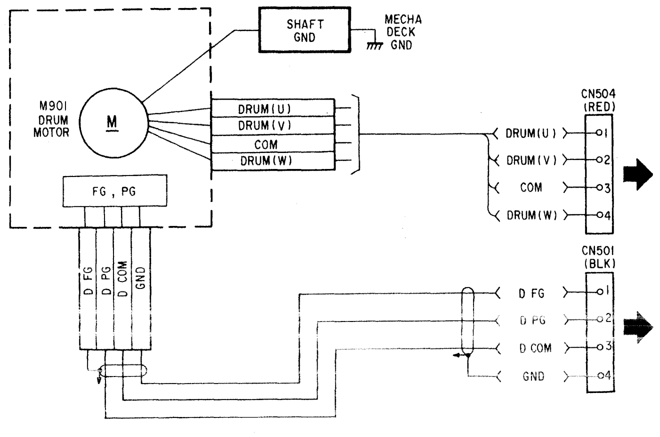
SS-70 BOARD (COMPONENT SIDE)


9
10
11
12
13
14
15
16
IC508
Q510
Q509
Q508
IC509
D504
D502
CN504
CN501
IC504
IC505
Q530
IC510
IC502
Q529
Q528
Q314
Q312
Q302
Q303
Q301
Q319
Q320
D302
D301
Q306
TO AU-31 B


D503
Q503
Q511
Q512
Q526
Q527
D501
IC501
Q313
Q501
Q323
IC302
IC305
Q309
TO CC-7 BOARD
FE ON
TO MV-11 BOARD
620-611
19
5
6
7
8

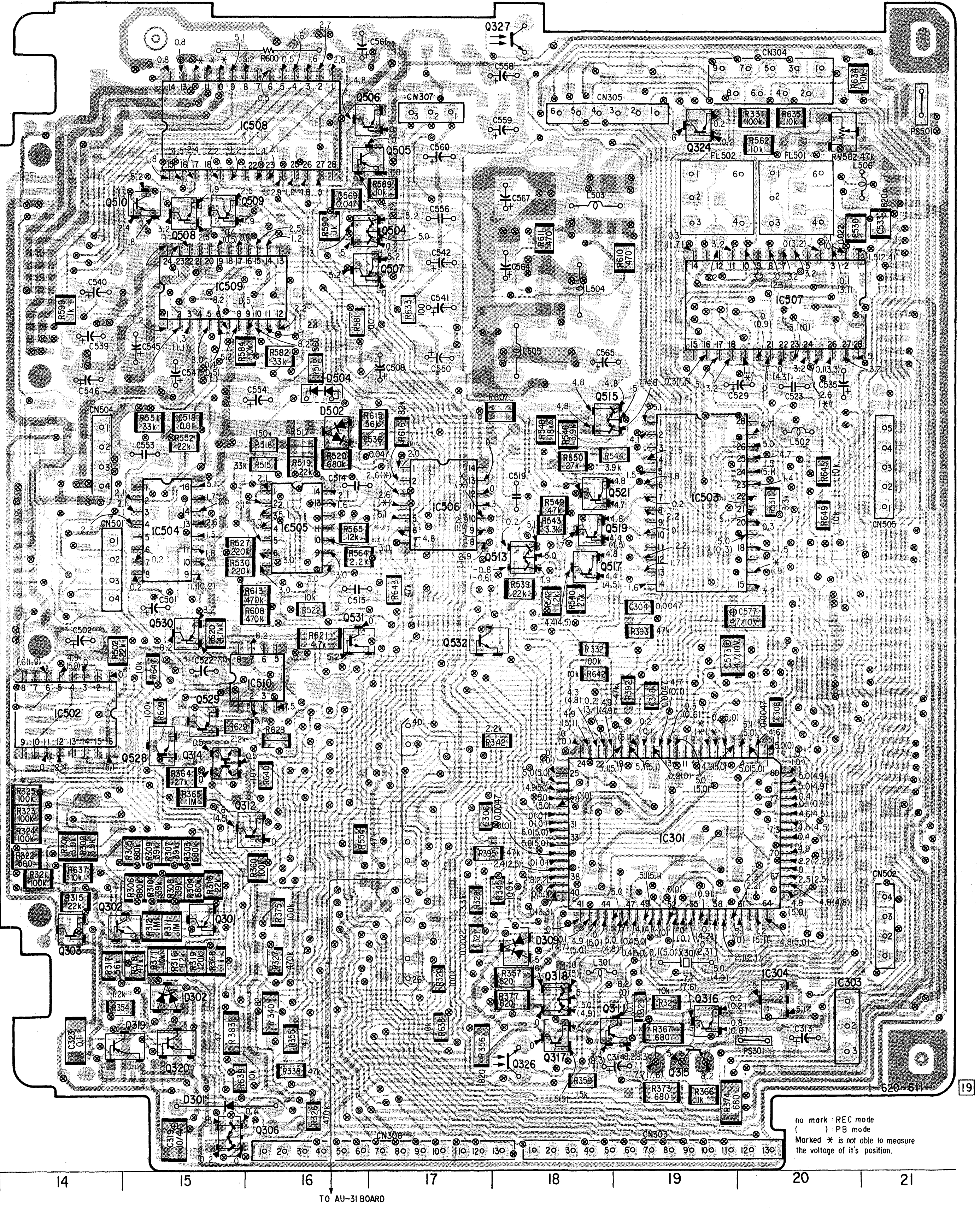
no mark : REC mode
( ) : PB mode
Marked * is not able to measure the voltage of it's position.


SV GND 15
C FG(+) 14
SV 5V 13
C FG(−) 12
UNREG GND 11
WHE(−) 10
WHE(+) 9
UHE(−) 8
UHE(+) 7
CAP(W) 6
VHE(−) 5
VHE(+) 4
HF 3
CAP(V) 2
CAP(U) 1
CAPSTAN FG
M902 CAPSTAN MOTOR
M


SHAFT GND
MECHA DECK GND
M901 DRUM MOTOR
M
DRUM(U)
DRUM(V)
COM
DRUM(W)
FG, PG
D FG
D PG
D COM
GND
CN504 (RED)
DRUM(U) 1
DRUM(V) 2
COM 3
DRUM(W) 4
CN501 (BLK)
D FG 1
D PG 2
D COM 3
GND 4

CN303	J-19
CN304	A-20
CN305	A-18
CN307	A-17
CN502	H-21
CN505	E-21
D301	J-15
D302	I-15
D502	D-16
D504	D-16
IC301	G-19
IC303	I-20
IC304	I-20
IC502	F-14
IC503	E-19
IC504	E-15
IC505	E-16
IC506	E-17
IC507	C-20
IC508	B-15
IC509	C-15
IC510	F-16
Q301	H-15
Q302	H-14
Q303	H-14
Q306	J-15
Q309	H-18
Q311	I-19
Q312	G-16
Q314	G-16
Q315	I-19
Q316	I-19
Q317	I-18
Q318	I-18
Q319	I-15
Q320	I-15
Q324	B-19
Q326	I-18
Q327	I-18
Q504	B-17
Q505	B-17
Q506	A-17
Q507	C-17
Q508	B-15
Q509	B-15
Q510	B-15
Q513	E-18
Q515	D-18
Q517	E-18
Q519	E-18
Q521	D-18
Q528	F-15
Q529	F-15
Q530	F-15
Q531	F-17
Q532	F-17
RV502	B-20

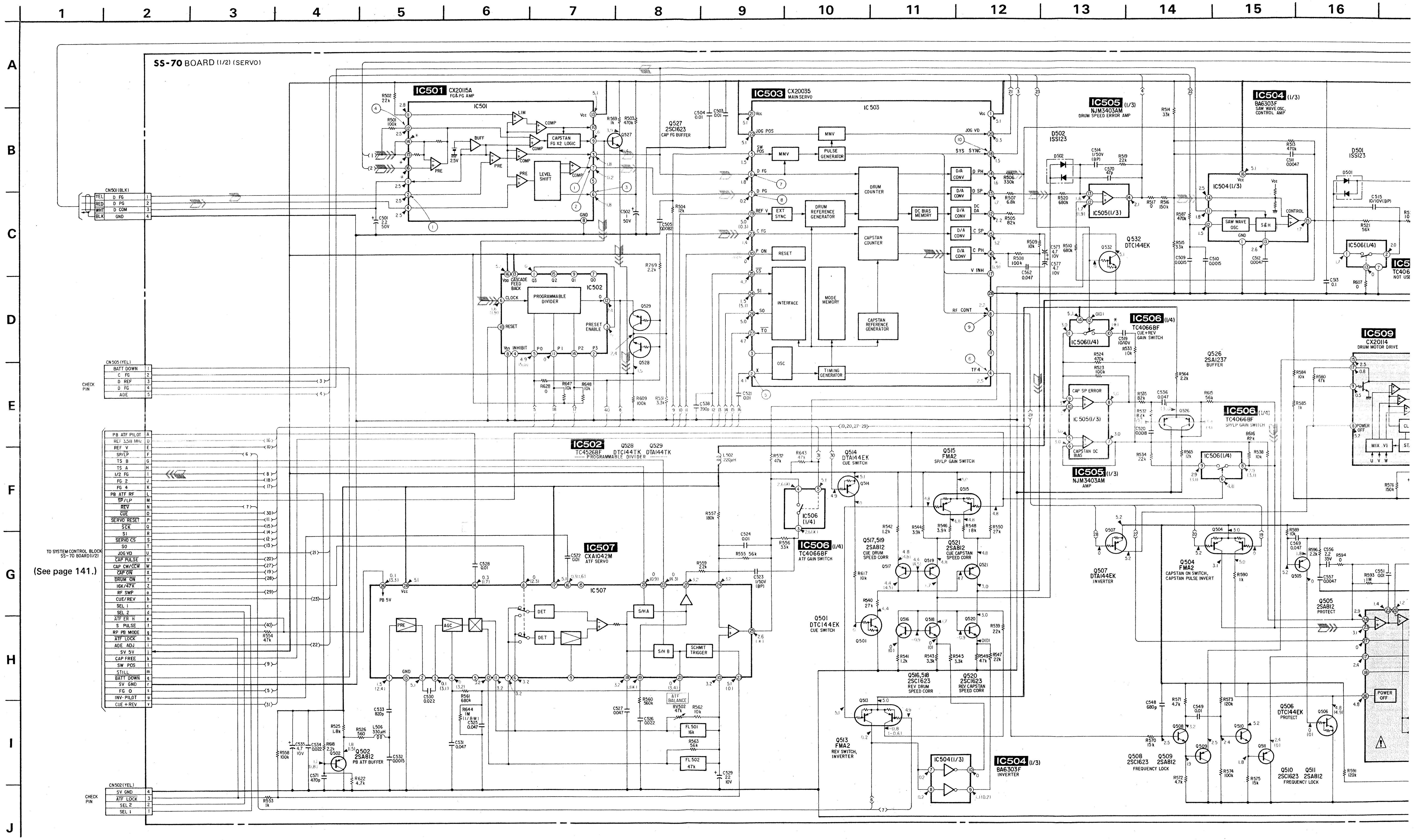
SS-70 BOARD (COMPONENT SIDE)

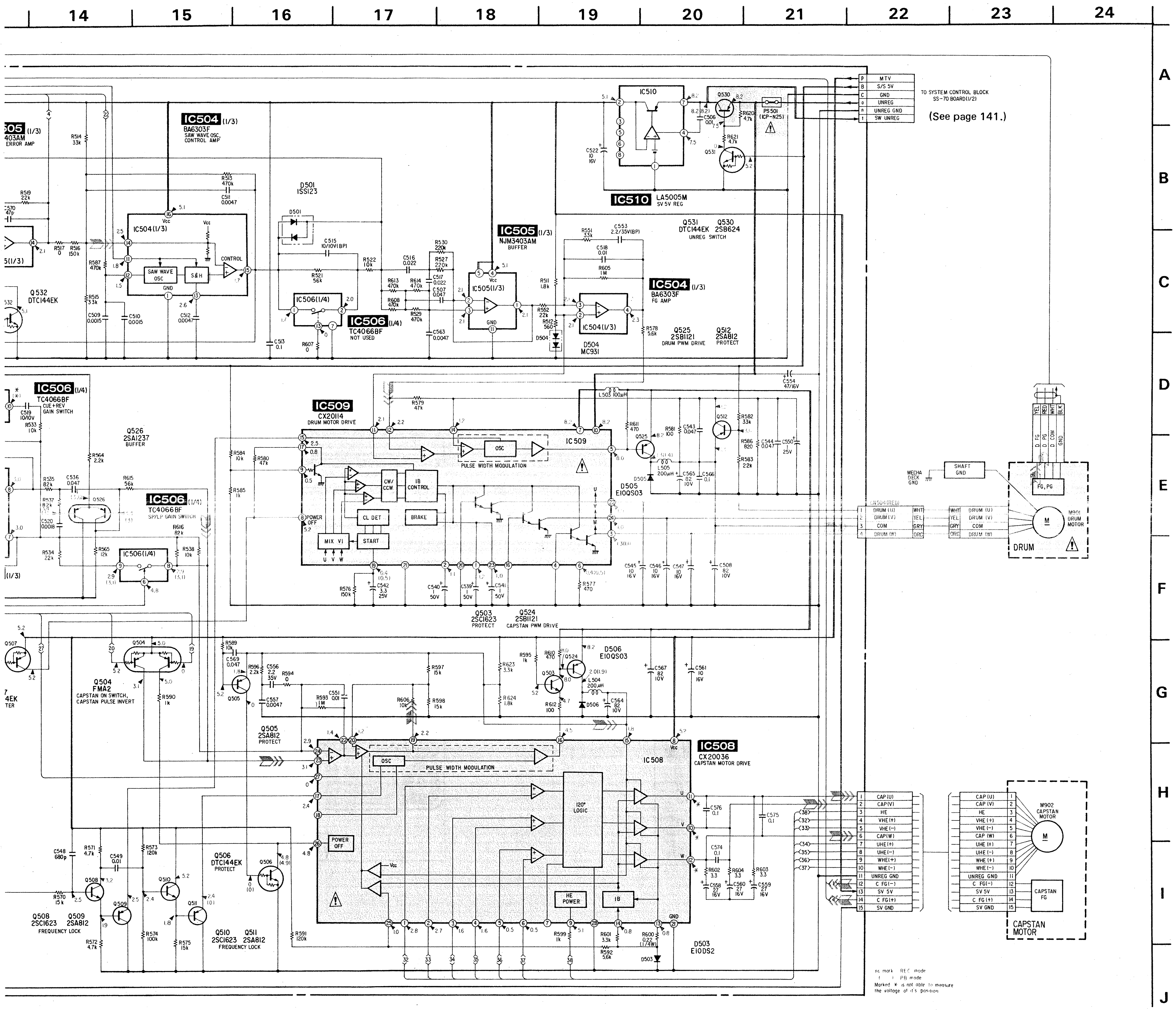

Q327
CN304
CN305
CN307
IC508
Q506
Q505
Q510
Q509
Q508
Q504
Q507
IC509
Q324
FL502
FL501
RV502
L506
PS501
IC507
L503
L504
L505
D504
D502
Q515
L502
CN504
CN501
IC504
IC505
IC506
Q521
Q519
Q517
Q513
IC503
CN505
Q530
Q531
Q532
IC502
Q529
Q528
Q314
Q312
IC301
CN502
Q302
Q303
D302
Q319
Q320
D301
Q306
D309
Q318
Q317
Q326
L301
Q311
Q315
Q316
IC304
IC303
PS301
CN303
CN306
620-611
19
TO AU-31 BOARD
14
15
16
17
18
19
20
21

no mark : REC mode
( ) : PB mode
Marked * is not able to measure the voltage of it's position.

SS-70(SERVO) SCHEMATIC DIAGRAM

—Ref. No. SS-70 BOARD: 5,000 Series—

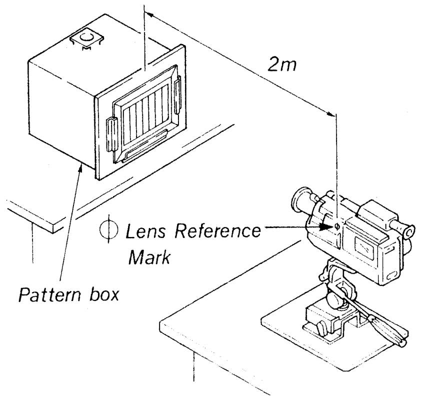

SS-70 BOARD (1/2) (SERVO)
IC501 CX20115A FG&PG AMP
IC503 CX20035 MAIN SERVO
IC505 (1/3) NJM3403AM DRUM SPEED ERROR AMP
IC504 (1/3) BA6303F SAW WAVE OSC, CONTROL AMP
IC502 TC4526BF PROGRAMMABLE DIVIDER
Q528 DTC144TK
Q529 DTA144TK
Q527 2SC1623 CAP FG BUFFER
IC507 CXA1042M ATF SERVO
IC506 (1/4) TC4066BF ATF GAIN SWITCH
IC506 (1/4) TC4066BF CUE+REV GAIN SWITCH
IC506 (1/4) TC4066BF SP/LP GAIN SWITCH
IC505 (1/3) NJM3403AM AMP
IC509 CX20114 DRUM MOTOR DRIVE
Q526 2SA1237 BUFFER
Q532 DTC144EK
Q514 DTA144EK CUE SWITCH
Q515 FMA2 SP/LP GAIN SWITCH
Q517,519 2SA812 CUE DRUM SPEED CORR
Q521 2SA812 CUE CAPSTAN SPEED CORR
Q501 DTC144EK CUE SWITCH
Q516,518 2SC1623 REV DRUM SPEED CORR
Q520 2SC1623 REV CAPSTAN SPEED CORR
Q513 FMA2 REV SWITCH, INVERTER
IC504 (1/3) BA6303F INVERTER
Q502 2SA812 PB ATF BUFFER
Q507 DTA144EK INVERTER
Q504 FMA2 CAPSTAN ON SWITCH, CAPSTAN PULSE INVERT
Q505 2SA812 PROTECT
Q506 DTC144EK PROTECT
Q508 2SC1623 Q509 2SA812 FREQUENCY LOCK
Q510 2SC1623 Q511 2SA812 FREQUENCY LOCK
D502 1SS123
D501 1SS123
CN501 (BLK) D FG, D PG, D COM, GND
CN505 (YEL) BATT DOWN, C FG, D REF, D FG, ADE
CHECK PIN
TO SYSTEM CONTROL BLOCK SS-70 BOARD (2/2)
(See page 141.)
PB ATF PILOT, REF 3.58 MHz, REF V, SP/LP, TS B, TS A, 1/2 FG, FG 2, FG 4, PB ATF RF, SP/LP, REV, CUE, SERVO RESET, SCK, SI, SERVO CS, SO, JOG VD, CAP PULSE, CAP CW/CCW, CAP ON, DRUM ON, 16K/47K, RF SWP, CUE/REV, SEL 1, SEL 2, ATF ER H, S PULSE, RP PB MODE, ATF LOCK, ADE ADJ, SV 5V, SW POS, STILL, BATT DOWN, SV GND, FG 0, INV PILOT, CUE+REV
CN502 (YEL) SV GND, ATF LOCK, SEL 2, SEL 1


14
15
16
17
18
19
20
21
22
23
24
A
B
C
D
E
F
G
H
I
J
IC504 (1/3) BA6303F SAW WAVE OSC CONTROL AMP
SAW WAVE OSC
S&H
CONTROL
IC510 LA5005M SV 5V REG
Q531 Q530 DTC144EK 2SB624 UNREG SWITCH
PS501 (ICP-N25)
TO SYSTEM CONTROL BLOCK SS-70 BOARD(1/2)
(See page 141.)
MTV
S/S 5V
GND
UNREG
UNREG GND
SW UNREG
D501 1SS123
IC505 (1/3) NJM3403AM BUFFER
IC504 (1/3) BA6303F FG AMP
IC506 (1/4) TC4066BF NOT USED
Q525 2SB1121 DRUM PWM DRIVE
Q512 2SA812 PROTECT
D504 MC931
IC506 (1/4) TC4066BF CUE+REV GAIN SWITCH
Q526 2SA1237 BUFFER
IC506 (1/4) TC4066BF SP/LP GAIN SWITCH
IC509 CX20114 DRUM MOTOR DRIVE
PULSE WIDTH MODULATION
OSC
CW/CCW
IB CONTROL
CL DET
BRAKE
MIX VI
START
POWER OFF
D505 E10QS03
Q503 2SC1623 PROTECT
Q524 2SB1121 CAPSTAN PWM DRIVE
MECHA DECK GND
SHAFT GND
FG,PG
M901 DRUM MOTOR
DRUM
Q532 DTC144EK
Q507
Q504 FMA2 CAPSTAN ON SWITCH, CAPSTAN PULSE INVERT
Q505 2SA812 PROTECT
D506 E10QS03
IC508 CX20036 CAPSTAN MOTOR DRIVE
120° LOGIC
HE POWER
IB
Q506 DTC144EK PROTECT
Q508 Q509 2SC1623 2SA812 FREQUENCY LOCK
Q510 Q511 2SC1623 2SA812 FREQUENCY LOCK
D503 E10DS2
CAP (U)
CAP (V)
HE
VHE (+)
VHE (−)
CAP (W)
UHE (+)
UHE (−)
WHE (+)
WHE (−)
UNREG GND
C FG (−)
SV 5V
C FG (+)
SV GND
M902 CAPSTAN MOTOR
CAPSTAN FG
CAPSTAN MOTOR

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ☐ : panel designation.
- ⊡ : Nonflammable resistor
- ─── : B+ bus.
- ☐ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

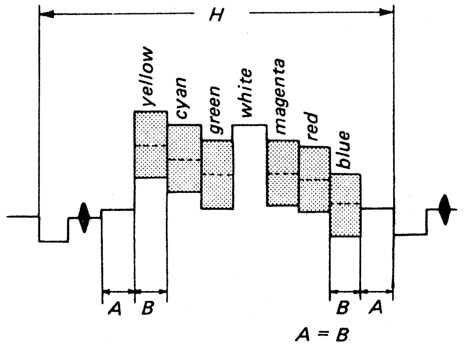

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

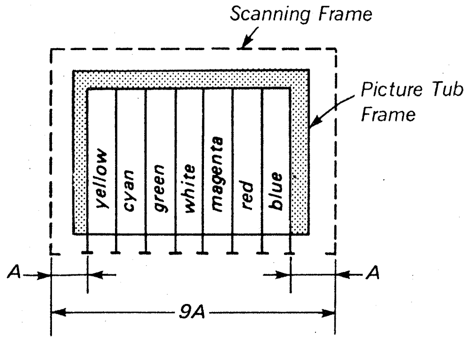

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

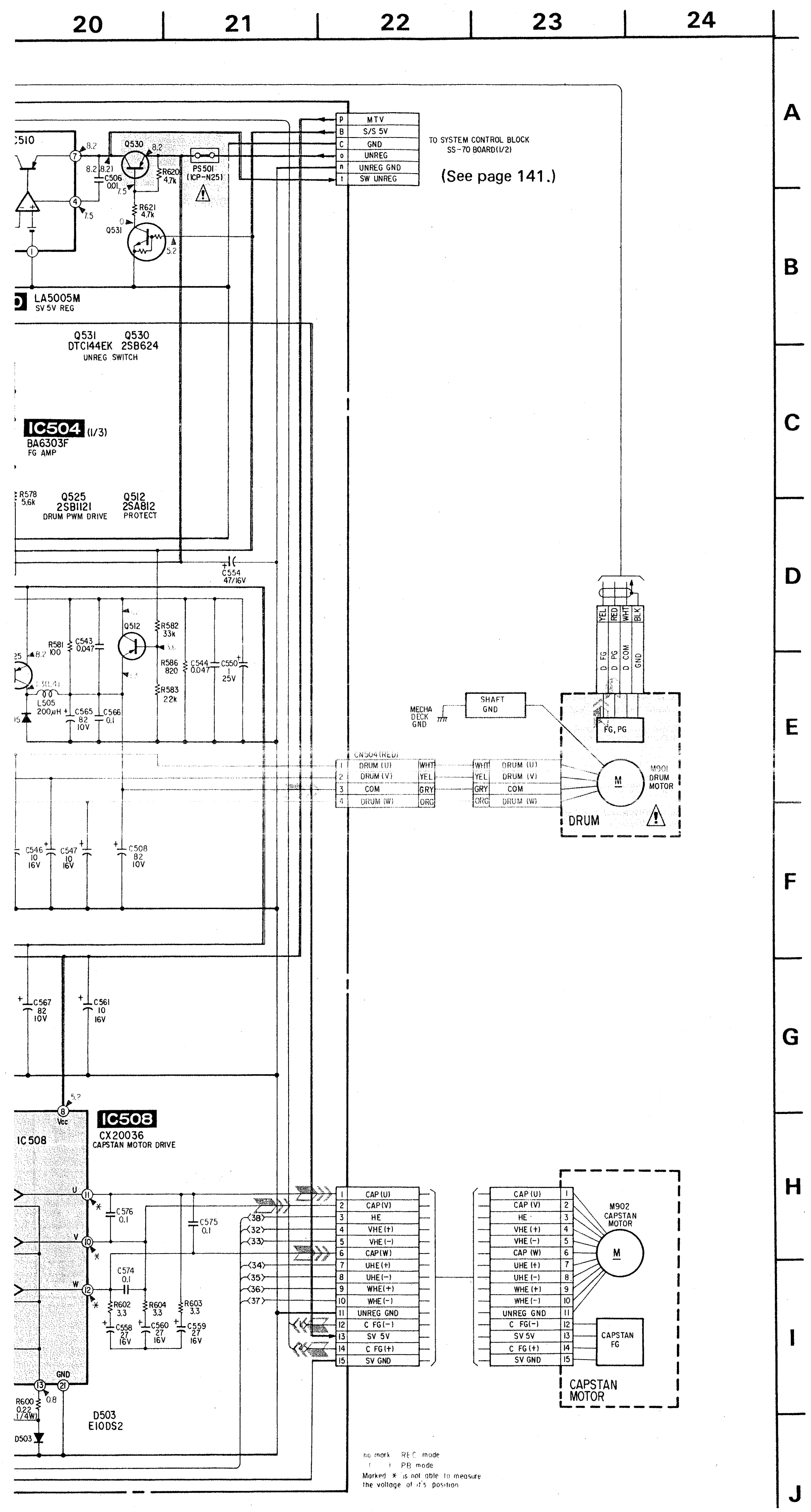
Fig. b Picture of TV monitor screen

Signal path

Drum speed servo
Drum phase servo
Drum servo (speed and pha
Capstan speed servo
Capstan phase servo
Capstan servo (speed and pl

Note: The components
⚠ are critical f
part number spe

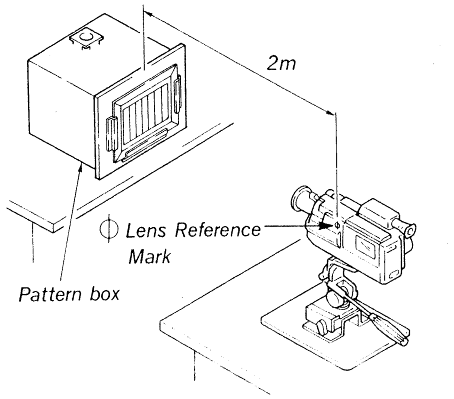
Note: Les composants
marque ⚠ sont c
remplacer que p
spécifié.


20
21
22
23
24
A
B
C
D
E
F
G
H
I
J
Q530
Q531
R620 4.7k
R621 4.7k
C506 0.01
PS501 (ICP-N25)
LA5005M
SV 5V REG
Q531 DTC144EK
Q530 2SB624
UNREG SWITCH
IC504 (1/3)
BA6303F
FG AMP
R578 5.6k
Q525 2SB1121
DRUM PWM DRIVE
Q512 2SA812
PROTECT
C554 47/16V
MTV
S/S 5V
GND
UNREG
UNREG GND
SW UNREG
TO SYSTEM CONTROL BLOCK
SS-70 BOARD(1/2)
(See page 141.)
YEL
RED
WHT
BLK
D FG
D PG
D COM
GND
SHAFT GND
MECHA DECK GND
FG, PG
CN504 (RED)
DRUM (U)
DRUM (V)
COM
DRUM (W)
WHT
YEL
GRY
ORG
M901
DRUM MOTOR
DRUM
IC508
CX20036
CAPSTAN MOTOR DRIVE
Vcc
GND
C576 0.1
C575 0.1
C574 0.1
R602 3.3
R604 3.3
R603 3.3
C558 27 16V
C560 27 16V
C559 27 16V
R600 0.22 1/4W
D503 E10DS2
CAP (U)
CAP (V)
HE
VHE (+)
VHE (−)
CAP (W)
UHE (+)
UHE (−)
WHE (+)
WHE (−)
UNREG GND
C FG (−)
SV 5V
C FG (+)
SV GND
M902
CAPSTAN MOTOR
CAPSTAN FG
CAPSTAN MOTOR
no mark : REC mode
( ) : PB mode
Marked ✱ is not able to measure the voltage of it's position

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

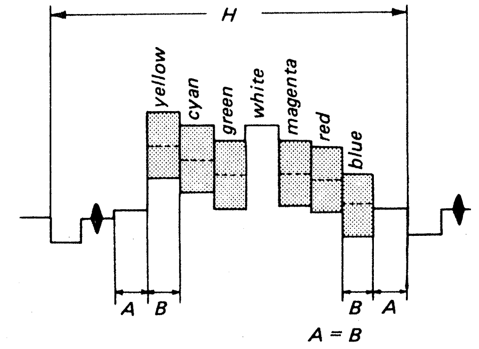

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

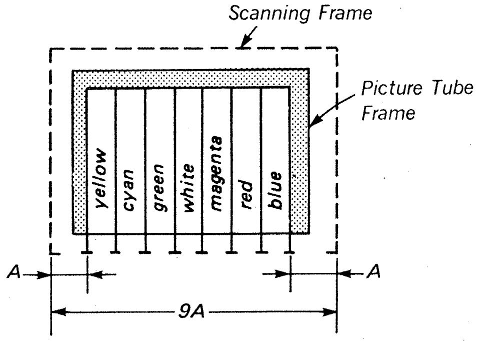

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

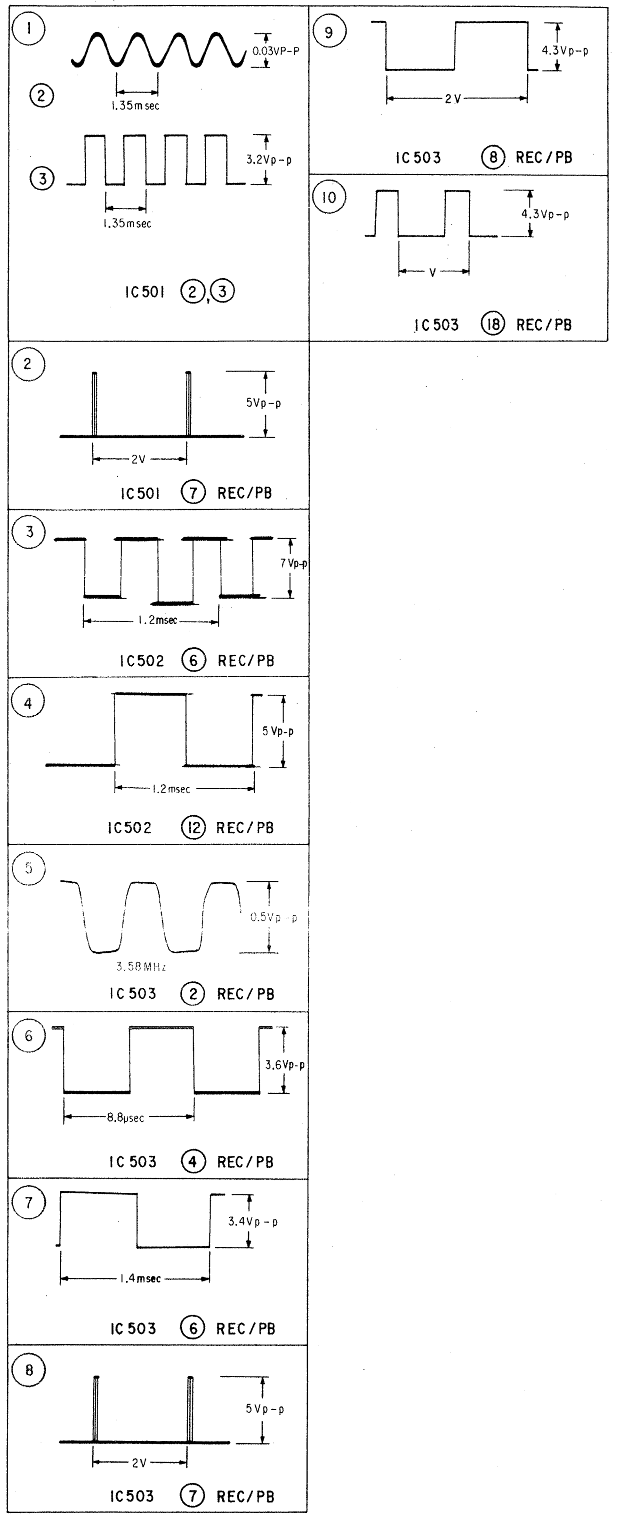
Signal path

	REC	REC/PB	PB
Drum speed servo		➤	
Drum phase servo		➤〉	
Drum servo (speed and phase)		➤〉〉	
Capstan speed servo		➤	
Capstan phase servo	➤〉		▷〉
Capstan servo (speed and phase)		➤〉〉	

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SS-70 BOARD


①
0.03VP-P
②
1.35m sec
③
3.2Vp-p
1.35m sec
IC501 ②,③
⑨
4.3Vp-p
2V
IC503 ⑧ REC/PB
⑩
4.3Vp-p
V
IC503 ⑱ REC/PB
②
5Vp-p
2V
IC501 ⑦ REC/PB
③
7Vp-p
1.2msec
IC502 ⑥ REC/PB
④
5Vp-p
1.2msec
IC502 ⑫ REC/PB
⑤
0.5Vp-p
3.58MHz
IC503 ② REC/PB
⑥
3.6Vp-p
8.8μsec
IC503 ④ REC/PB
⑦
3.4Vp-p
1.4msec
IC503 ⑥ REC/PB
⑧
5Vp-p
2V
IC503 ⑦ REC/PB

SYSTEM CONTROL, AUDIO

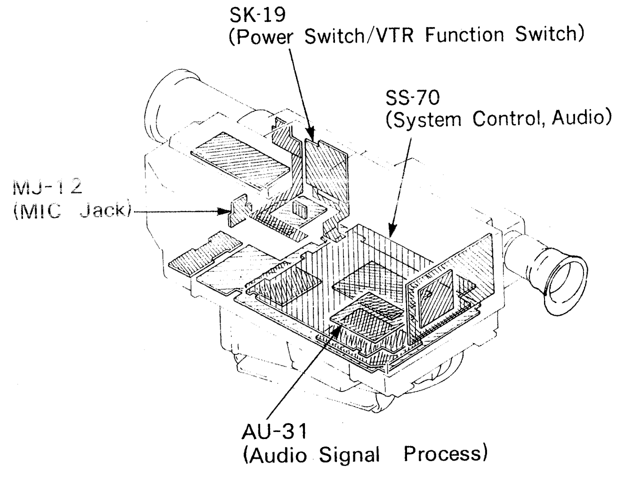
Note:

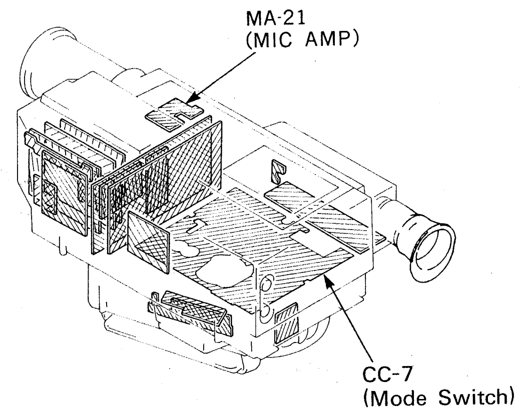
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.
- Digital transistor (SS-70: Q307, Q309, Q310, Q311, Q317, Q318, Q321, Q322, Q324, Q325, Q328, Q501, Q504, Q506, Q507, Q513, Q514, Q528, Q529, Q531, Q532) transistor with resistor.
- Refer to the SS-70 board schematic diagram for digital transistor.

Caution:

Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

When indicating parts by reference number, please include the board name.

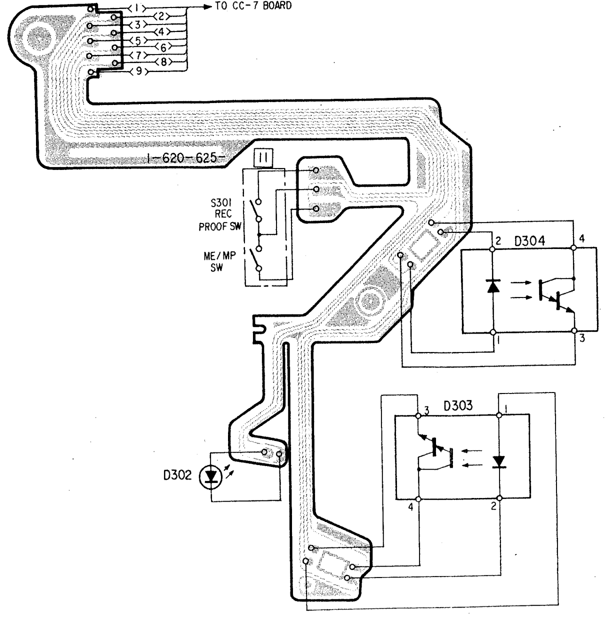

SK-19
(Power Switch/VTR Function Switch)
SS-70
(System Control, Audio)
MJ-12
(MIC Jack)
AU-31
(Audio Signal Process)


MA-21
(MIC AMP)
CC-7
(Mode Switch)

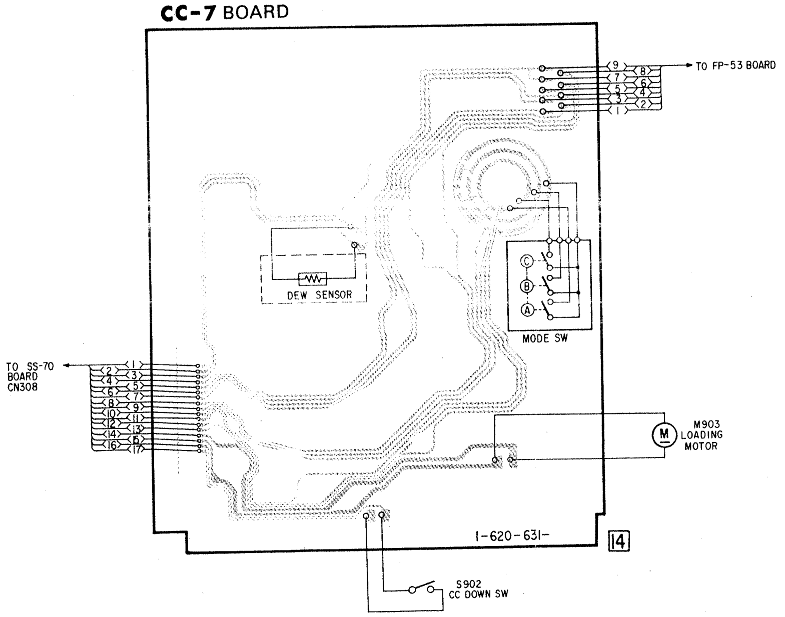
SS-70(SYSTEM CONTROL), AU-31(AUDIO SIGNAL PROCESS), SK-19(POWER SWITCH/VTR FUNCTION SWITCH), MA-21(MIC AMP), MJ-12(MIC JACK), CC-7(MODE SWITCH), FP-53(TA

—Ref. No. SS-70, SK-19, AU-31 and MA-21 BOARDS : 5, 000 series, MJ-12 BOARD : 6, 000 series—

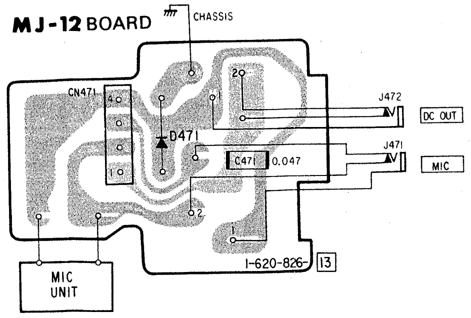
FP-53 BOARD (FLEXIBLE)


TO CC-7 BOARD
1-620-625-
11
S301 REC PROOF SW
ME/MP SW
D304
D303
D302

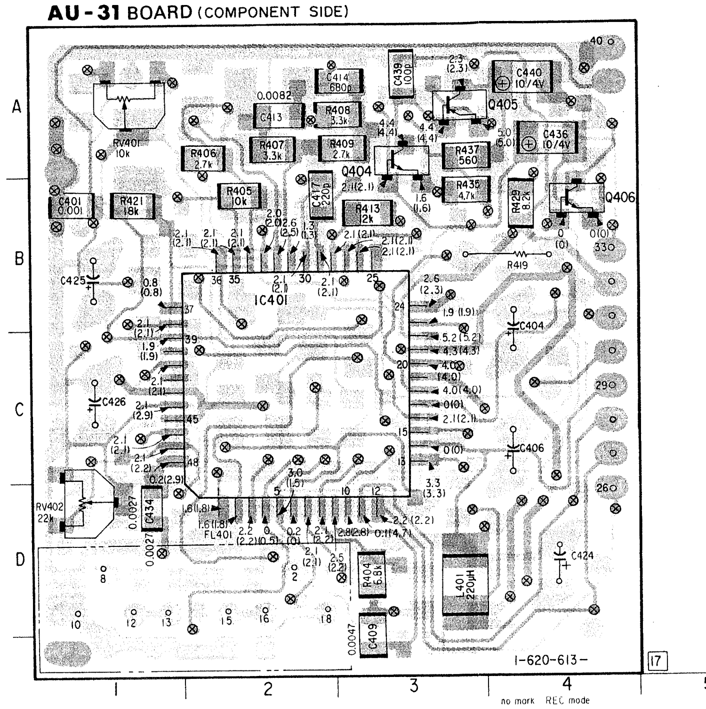
CC-7 BOARD


TO FP-53 BOARD
DEW SENSOR
MODE SW
TO SS-70 BOARD CN308
M903 LOADING MOTOR
1-620-631-
14
S902 CC DOWN SW

MJ-12 BOARD


CHASSIS
CN471
D471
J472
DC OUT
C471 0.047
J471
MIC
MIC UNIT
1-620-826-
13

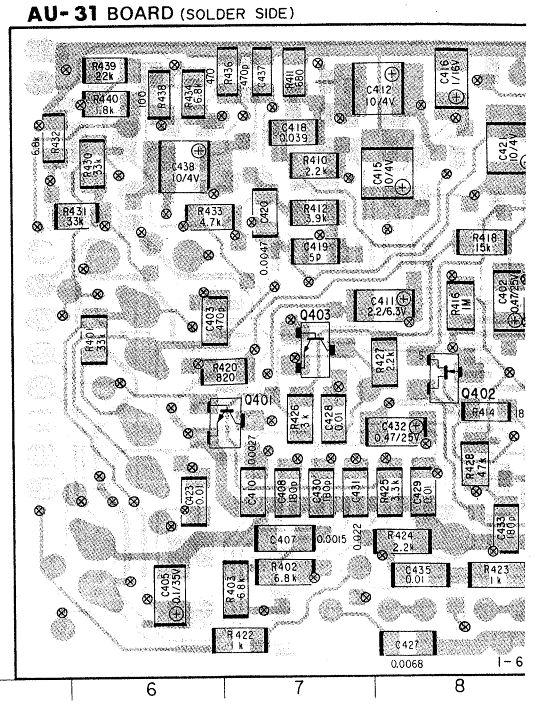
AU-31 BOARD (COMPONENT SIDE)


A
B
C
D
IC401
Q404
Q405
Q406
RV401
RV402
L401 220μH
1-620-613-
17
1
2
3
4

no mark : REC mode
( ) : PB mode

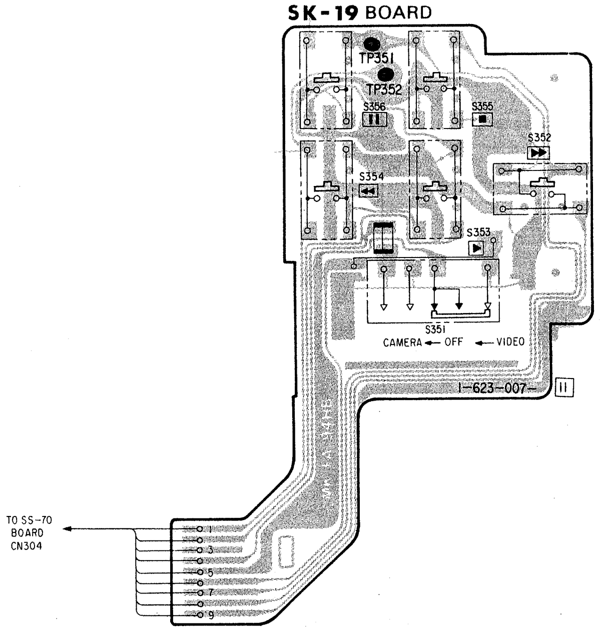
IC401	C-2
Q404	A-3
Q405	A-3
Q406	B-4
RV401	A-1
RV402	D-1

AU-31 BOARD (SOLDER SIDE)

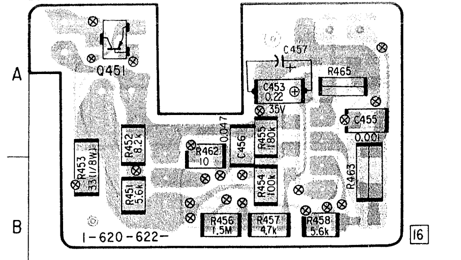

Q401
Q402
Q403
5
6
7
8

Q401	C-7
Q402	C-8
Q403	C-7

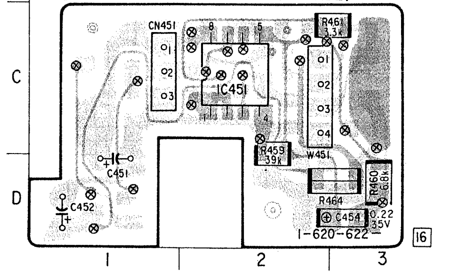
SK-19 BOARD


TP351
TP352
S356
S355
S352
S354
S353
S351
CAMERA ← OFF → VIDEO
1-623-007-
11
TO SS-70 BOARD CN304

MA-21 BOARD (SOLDER SIDE)

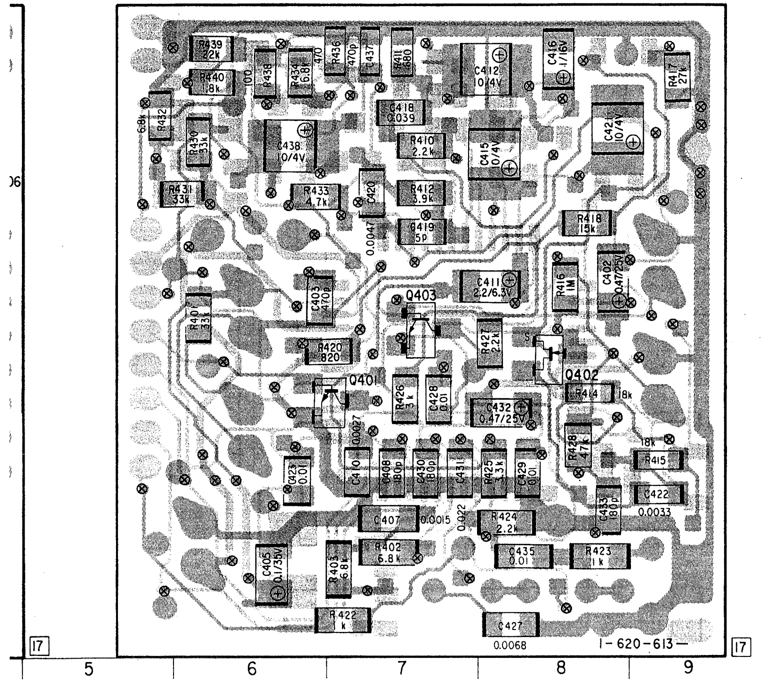

A
B
Q451
1-620-622-
16

MA-21 BOARD (COMPONENT SIDE)


C
D
CN451
IC451
1-620-622
16
1
2
3

MJ-12(MIC JACK), CC-7(MODE SWITCH), FP-53(TAPE SELECT/CASSETTE IN SWITCH) PRINTED WIRING BOARDS

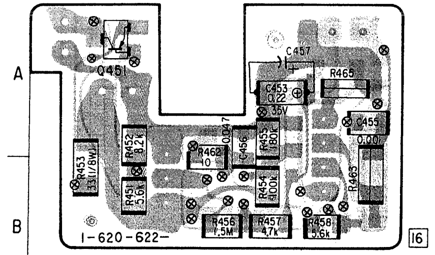
AU-31 BOARD (SOLDER SIDE)



1-620-613-
17
5
6
7
8
9
Q401
Q402
Q403

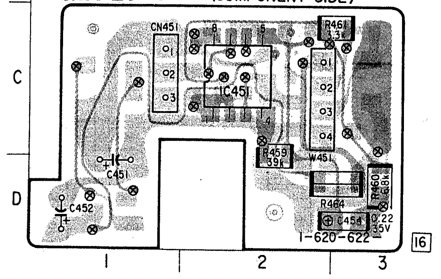
Q401	C-7
Q402	C-8
Q403	C-7

MA-21 BOARD (SOLDER SIDE)



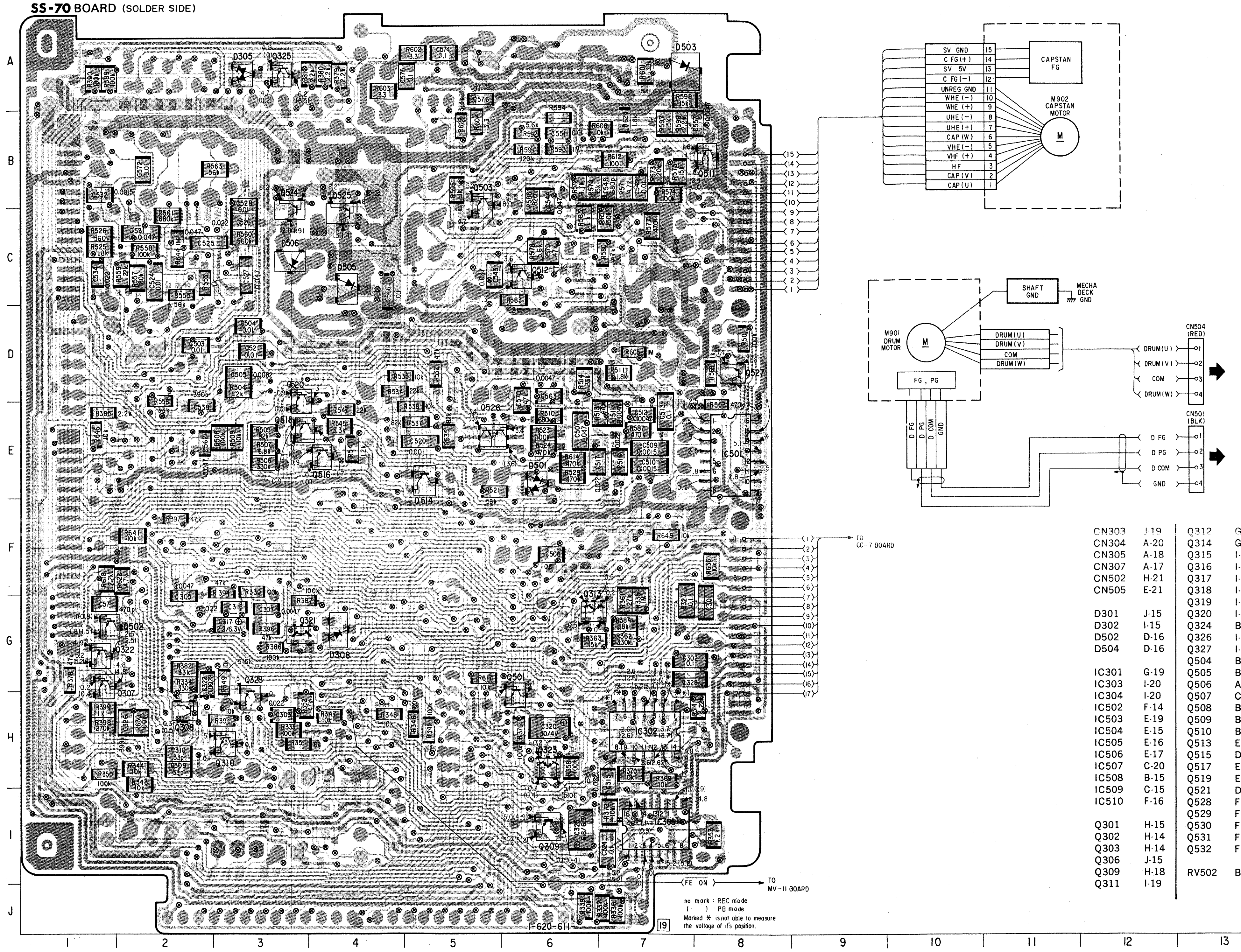
A
B
Q451
C457
R465
1-620-622-
16

MA-21 BOARD (COMPONENT SIDE)



C
D
CN451
IC451
C451
C452
W451
1-620-622
16
1
2
3

SS-70 BOARD (SOLDER SIDE)



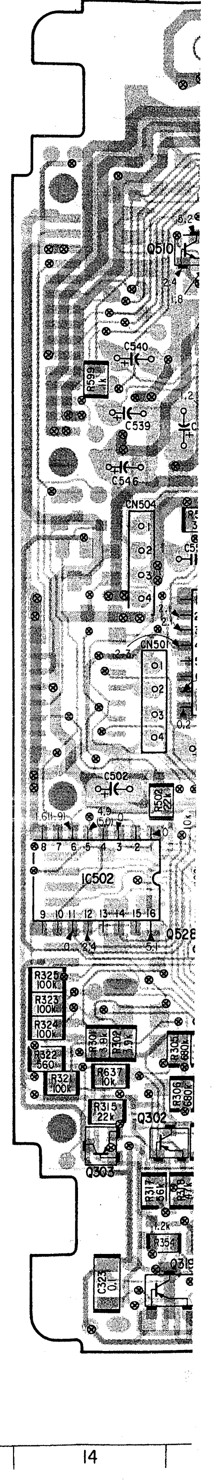
A
B
C
D
E
F
G
H
I
J
SV GND 15
C FG(+) 14
SV 5V 13
C FG(−) 12
UNREG GND 11
WHE (−) 10
WHE (+) 9
UHE (−) 8
UHE (+) 7
CAP (W) 6
VHE (−) 5
VHF (+) 4
HF 3
CAP (V) 2
CAP (U) 1
CAPSTAN FG
M902 CAPSTAN MOTOR
M
SHAFT GND
MECHA DECK GND
M901 DRUM MOTOR
DRUM (U)
DRUM (V)
COM
DRUM (W)
FG, PG
D FG
D PG
D COM
GND
CN504 (RED)
CN501 (BLK)
TO CC-7 BOARD
FE ON
TO MV-11 BOARD
1-620-611
19
1
2
3
4
5
6
7
8
9
10
11
12
13
14

no mark : REC mode
(   ) : PB mode
Marked ✱ is not able to measure the voltage of it's position.

D305	A-3
D501	E-6
D503	A-7
D505	C-4
D506	C-3
IC302	H-7
IC305	I-7
IC501	E-8
Q307	G-1
Q308	H-2
Q309	I-6
Q310	H-3
Q313	G-6
Q321	G-3
Q322	G-1
Q323	H-6
Q325	A-3
Q328	H-3
Q501	G-6
Q502	G-1
Q503	C-5
Q511	B-8
Q512	C-6
Q514	E-5
Q516	E-4
Q518	E-4
Q520	E-4
Q524	C-3
Q525	C-4
Q526	E-6
Q527	D-8

CN303	J-19
CN304	A-20
CN305	A-18
CN307	A-17
CN502	H-21
CN505	E-21
D301	J-15
D302	I-15
D502	D-16
D504	D-16
IC301	G-19
IC303	I-20
IC304	I-20
IC502	F-14
IC503	E-19
IC504	E-15
IC505	E-16
IC506	E-17
IC507	C-20
IC508	B-15
IC509	C-15
IC510	F-16
Q301	H-15
Q302	H-14
Q303	H-14
Q306	J-15
Q309	H-18
Q311	I-19
Q312	G-16
Q314	G-16
Q315	I-19
Q316	I-19
Q317	I-18
Q318	I-18
Q319	I-15
Q320	I-15
Q324	B-19
Q326	I-18
Q327	I-18
Q504	B-17
Q505	B-17
Q506	A-17
Q507	C-17
Q508	B-15
Q509	B-15
Q510	B-15
Q513	E-18
Q515	D-18
Q517	E-18
Q519	E-18
Q521	D-18
Q528	F-15
Q529	F-15
Q530	F-15
Q531	F-17
Q532	F-17
RV502	B-20

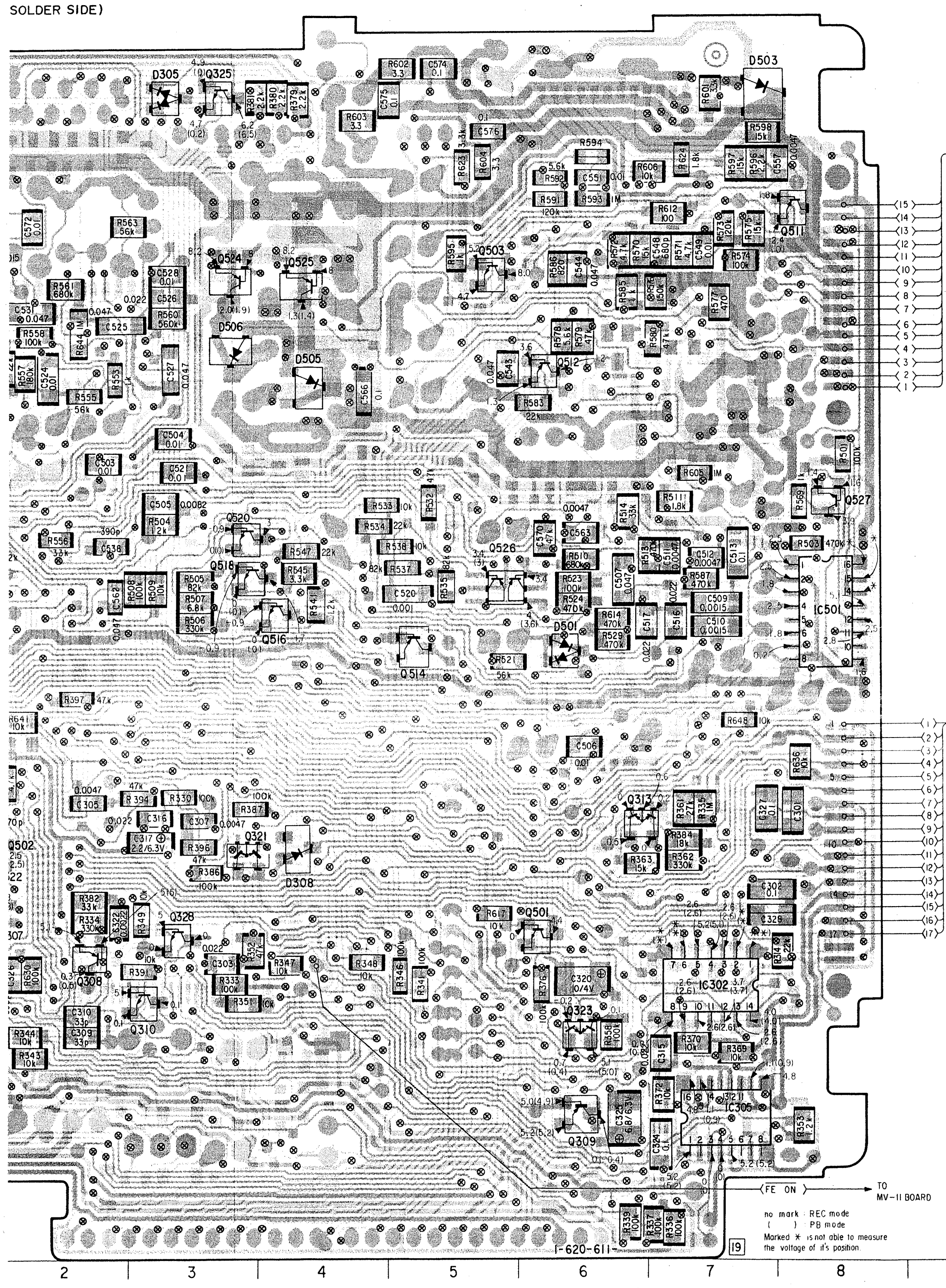
SS-70 BOA



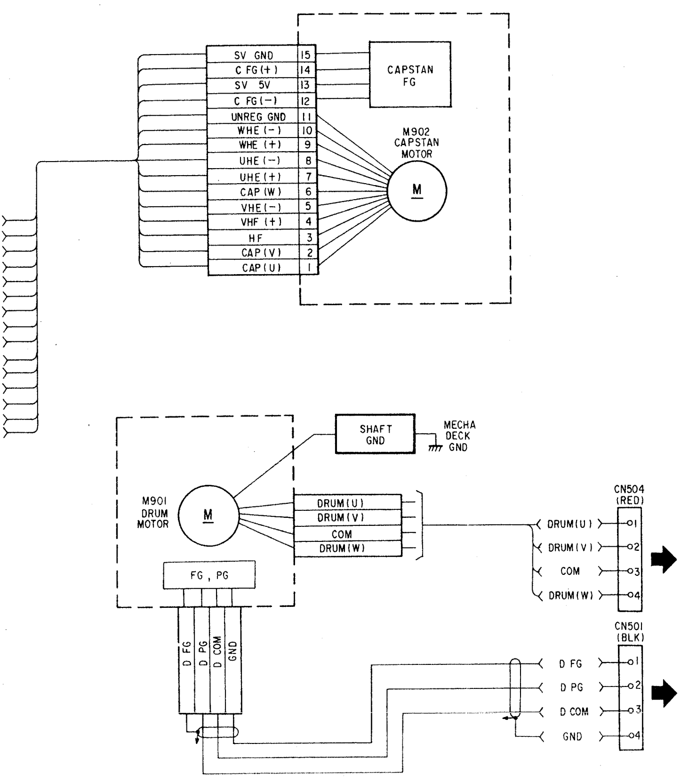
CN504
IC502
14

INTED WIRING BOARDS

SOLDER SIDE)

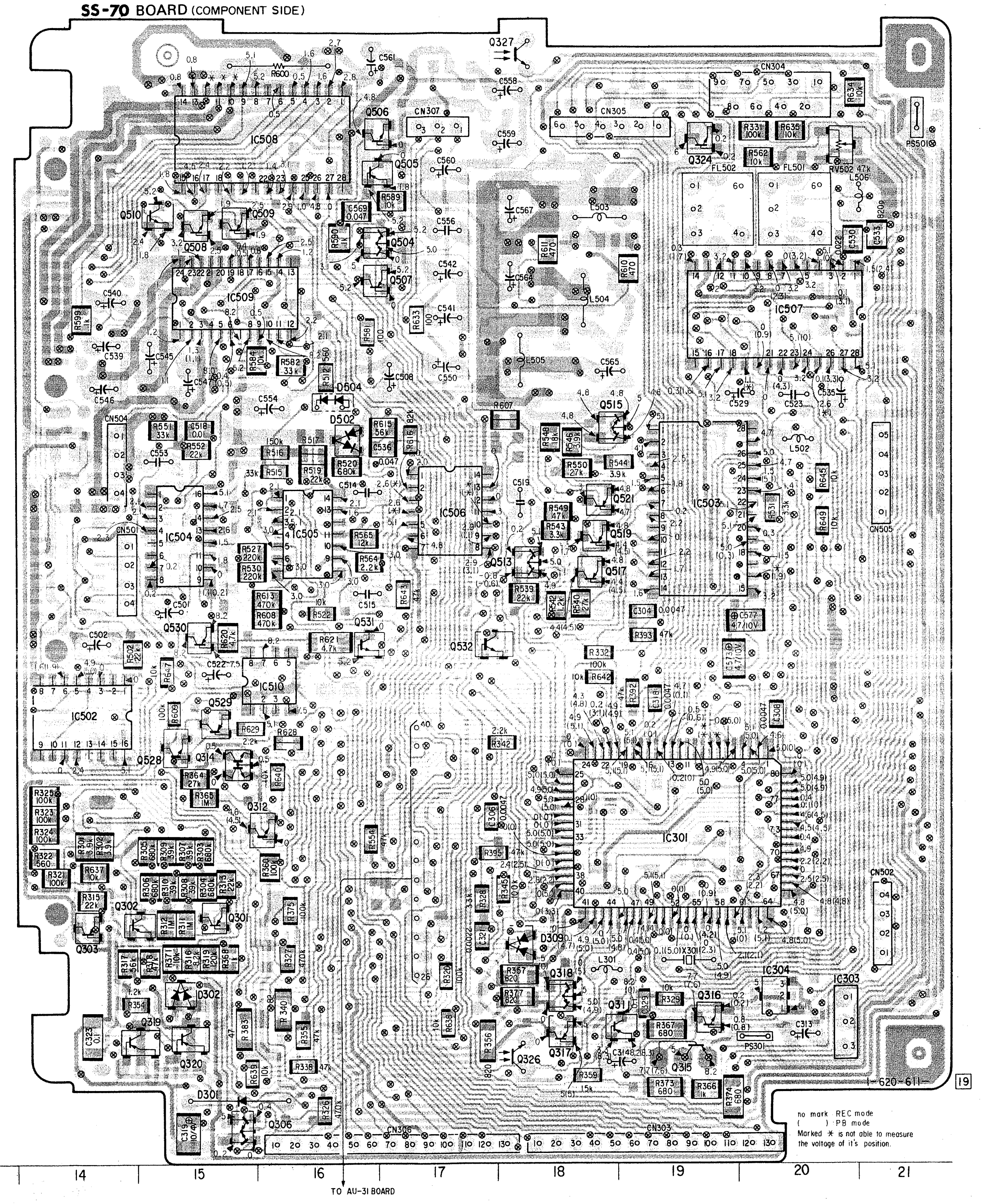

TO CC-7 BOARD
FE ON
TO MV-11 BOARD
1-620-611-
19
2
3
4
5
6
7
8

no mark : REC mode
( ) : PB mode
Marked ✱ is not able to measure the voltage of it's position.


SV GND
C FG(+)
SV 5V
C FG(−)
UNREG GND
WHE(−)
WHE(+)
UHE(−)
UHE(+)
CAP(W)
VHE(−)
VHE(+)
HF
CAP(V)
CAP(U)
CAPSTAN FG
M902 CAPSTAN MOTOR
M
SHAFT GND
MECHA DECK GND
M901 DRUM MOTOR
FG, PG
DRUM(U)
DRUM(V)
COM
DRUM(W)
CN504 (RED)
CN501 (BLK)
D FG
D PG
D COM
GND

CN303	J-19	Q312	G-16
CN304	A-20	Q314	G-16
CN305	A-18	Q315	I-19
CN307	A-17	Q316	I-19
CN502	H-21	Q317	I-18
CN505	E-21	Q318	I-18
		Q319	I-15
D301	J-15	Q320	I-15
D302	I-15	Q324	B-19
D502	D-16	Q326	I-18
D504	D-16	Q327	I-18
		Q504	B-17
IC301	G-19	Q505	B-17
IC303	I-20	Q506	A-17
IC304	I-20	Q507	C-17
IC502	F-14	Q508	B-15
IC503	E-19	Q509	B-15
IC504	E-15	Q510	B-15
IC505	E-16	Q513	E-18
IC506	E-17	Q515	D-18
IC507	C-20	Q517	E-18
IC508	B-15	Q519	E-18
IC509	C-15	Q521	D-18
IC510	F-16	Q528	F-15
		Q529	F-15
Q301	H-15	Q530	F-15
Q302	H-14	Q531	F-17
Q303	H-14	Q532	F-17
Q306	J-15		
Q309	H-18	RV502	B-20
Q311	I-19		

SS-70 BOARD (COMPONENT SIDE)

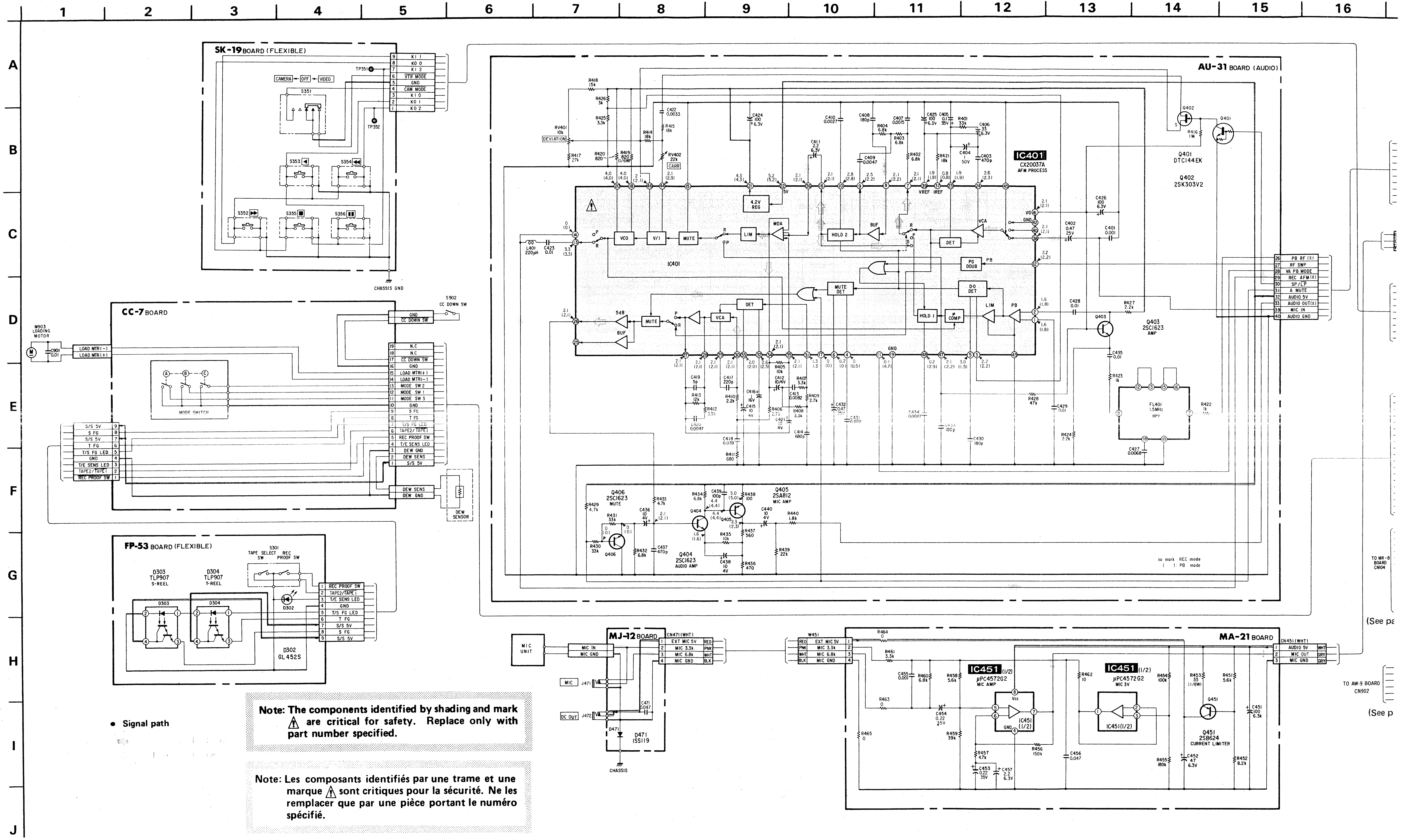

IC508
IC509
IC504
IC505
IC506
IC503
IC507
IC502
IC510
IC301
IC303
IC304
CN304
CN305
CN307
CN502
CN505
TO AU-31 BOARD
1-620-611-
19
14
15
16
17
18
19
20
21

no mark : REC mode
( ) : PB mode
Marked ✱ is not able to measure the voltage of it's position.

SYSTEM CONTROL, AUDIO   SYSTEM CONTROL, AUDIO

SS-70(SYSTEM CONTROL), AU-31(AUDIO SIGNAL PROCESS), SK-19(POWER SWITCH/VTR FUNCTION SWITCH), MA-21(MIC AMP), MJ-12(MIC JACK), CC-7(MODE SWITCH), FP-53(TAPE SELECT/CASSETTE IN SWITCH) SCHEMATIC DIAGRAM

—Ref. No. SS-70, SK-19, AU-31 and MA-21 BOARDS : 5, 000 series, MJ-12 BOARD : 6, 000 series—

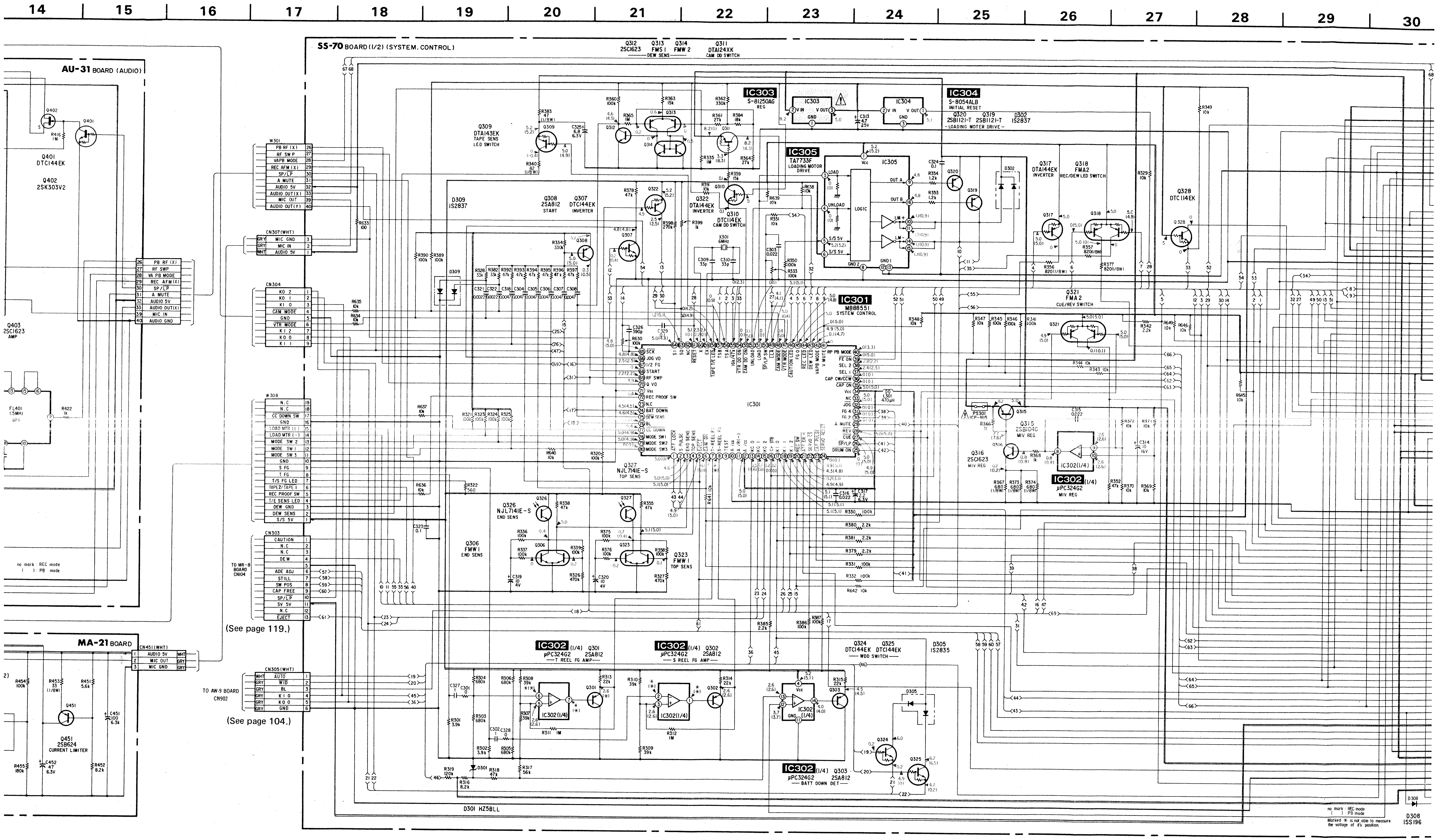

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
SK-19 BOARD (FLEXIBLE)
CAMERA
OFF
VIDEO
S351
TP351
TP352
S353
S354
S352
S355
S356
KI 1
KO 0
KI 2
VTR MODE
GND
CAM MODE
KI 0
KO 1
KO 2
CHASSIS GND
S902
CC DOWN SW
CC-7 BOARD
M903
LOADING MOTOR
C901 0.01
LOAD MTR(−)
LOAD MTR(+)
MODE SWITCH
N.C
CC DOWN SW
LOAD MTR(+)
LOAD MTR(−)
MODE SW 2
MODE SW 1
MODE SW 3
S FG
T FG
T/S FG LED
TAPE2/TAPE1
REC PROOF SW
T/E SENS LED
DEW GND
DEW SENS
S/S 5V
DEW SENSOR
FP-53 BOARD (FLEXIBLE)
S301
TAPE SELECT SW
REC PROOF SW
D303 TLP907 S-REEL
D304 TLP907 T-REEL
D302
D302 GL452S
AU-31 BOARD (AUDIO)
IC401
CX20037A
AFM PROCESS
RV401 10k
DEVIATION
RV402 22k
CARR
4.2V REG
VCO
V/I
MUTE
LIM
MDA
HOLD 2
BUF
VCA
DET
PG DOUB
DO DET
MUTE DET
HOLD 1
COMP
5dB
L401 220μH
Q401 DTC144EK
Q402 2SK303V2
Q403 2SC1623 AMP
FL401 1.5MHz BPF
Q406 2SC1623 MUTE
Q404 2SC1623 AUDIO AMP
Q405 2SA812 MIC AMP
no mark REC mode
( ) PB mode
PB RF (X)
RF SWP
VA PB MODE
REC AFM(X)
SP/LP
A MUTE
AUDIO 5V
AUDIO OUT(X)
MIC IN
AUDIO GND
TO MR-8 BOARD CN104
(See pa
MIC UNIT
MJ-12 BOARD
MIC IN
MIC GND
CN471(WHT)
EXT MIC 5V
MIC 3.3k
MIC 6.8k
RED
PNK
WHT
BLK
MIC
J471
DC OUT
J472
D471 1SS119
CHASSIS
W451
MA-21 BOARD
IC451 (1/2)
μPC4572G2
MIC AMP
MIC 3V
Q451 2SB624
CURRENT LIMITER
CN451(WHT)
AUDIO 5V
MIC OUT
GRY
TO AW-9 BOARD CN902
(See p

• Signal path

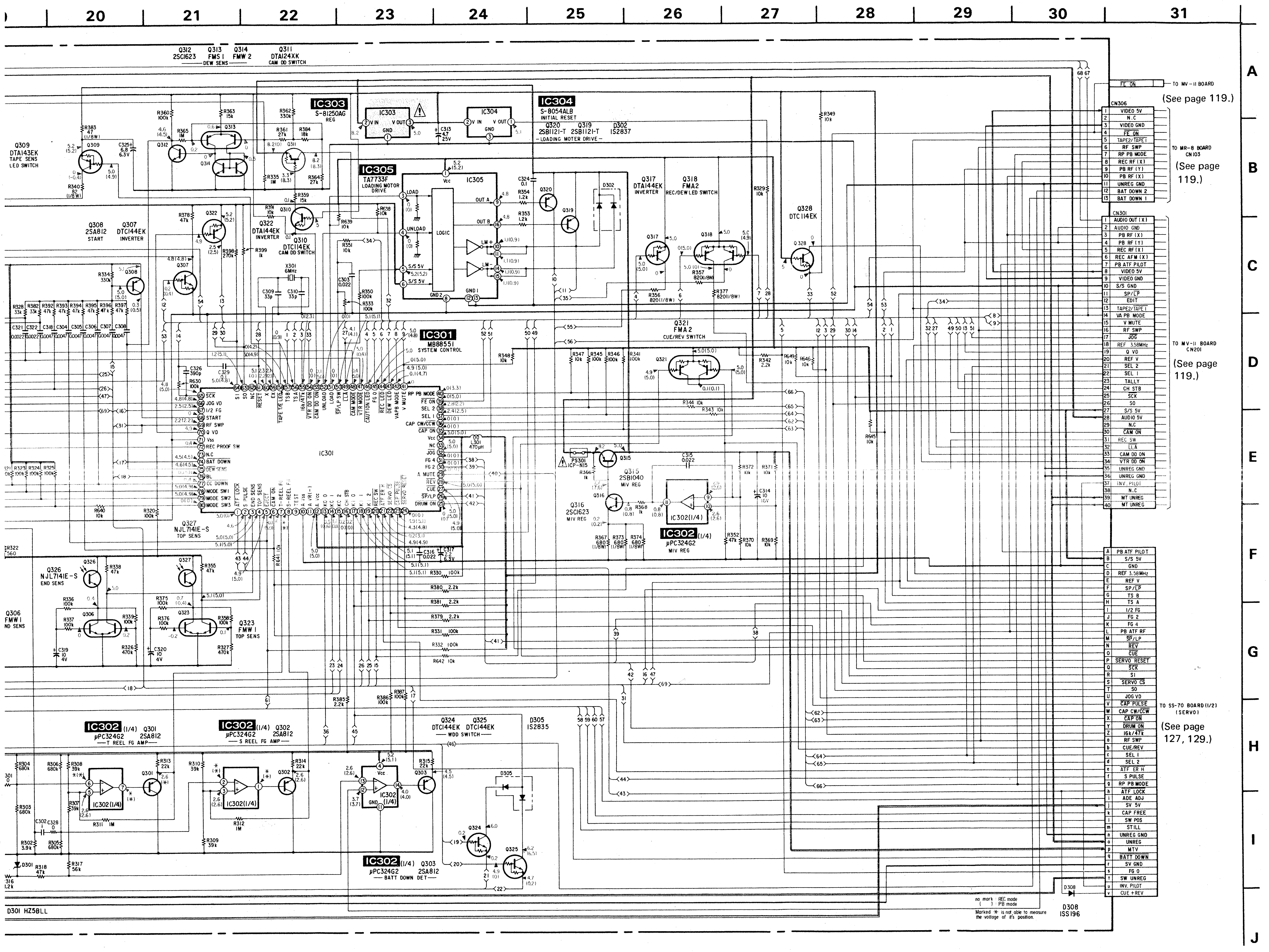
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SETTE IN SWITCH) SCHEMATIC DIAGRAM


14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
AU-31 BOARD (AUDIO)
SS-70 BOARD (1/2) (SYSTEM. CONTROL)
MA-21 BOARD
IC303 S-81250AG REG
IC304 S-8054ALB INITIAL RESET
IC305 TA7733F LOADING MOTOR DRIVE
IC301 MB88551 SYSTEM CONTROL
IC302 (1/4) μPC324G2 MIV REG
IC302 (1/4) Q301 μPC324G2 2SA812 — T REEL FG AMP —
IC302 (1/4) Q302 μPC324G2 2SA812 — S REEL FG AMP —
IC302 (1/4) Q303 μPC324G2 2SA812 — BATT DOWN DET —
Q324 Q325 DTC144EK DTC144EK — WDD SWITCH —
D305 1S2835
Q320 Q319 Q302 2SB1121-T 2SB1121-T 1S2837 — LOADING MOTER DRIVE —
Q317 DTA144EK INVERTER
Q318 FMA2 REC/DEW LED SWITCH
Q321 FMA2 CUE/REV SWITCH
Q328 DTC114EK
Q315 2SB1040 MIV REG
Q316 2SC1623 MIV REG
Q312 2SC1623
Q313 FMS1
Q314 FMW2 — DEW SENS —
Q311 DTA124XK CAM OD SWITCH
Q309 DTA143EK TAPE SENS LED SWITCH
Q308 2SA812 START
Q307 DTC144EK INVERTER
D309 1S2837
Q322 DTA144EK INVERTER
Q310 DTC114EK CAM OD SWITCH
Q326 NJL7141E-S END SENS
Q327 NJL7141E-S TOP SENS
Q306 FMW1 END SENS
Q323 FMW1 TOP SENS
Q401 DTC144EK
Q402 2SK303V2
Q403 2SC1623 AMP
FL401 1.5MHz BPF
Q451 2SB624 CURRENT LIMITER
D301 HZ5BLL
D308 1SS196
W301
CN307 (WHT)
CN304
W308
CN303
CN451 (WHT)
CN305 (WHT)
TO MR-8 BOARD CN104
TO AW-9 BOARD CN902
(See page 119.)
(See page 104.)
no mark : REC mode
( ) : PB mode
Marked ✻ is not able to measure the voltage of it's position.

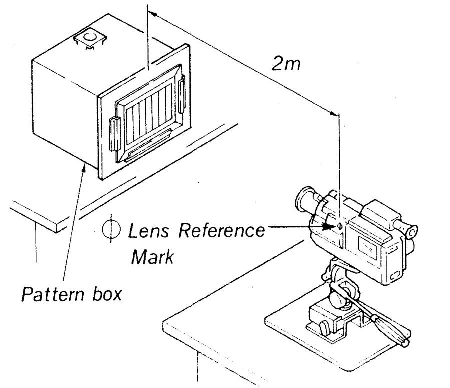
SYSTEM CONTROL,AUDI


20
21
22
23
24
25
26
27
28
29
30
31
A
B
C
D
E
F
G
H
I
J
Q312 2SC1623
Q313 FMS1
Q314 FMW2
DEW SENS
Q311 DTA124XK CAM DD SWITCH
Q309 DTA143EK TAPE SENS LED SWITCH
IC303 S-81250AG REG
IC304 S-8054ALB INITIAL RESET
Q320 2SB1121-T
Q319 2SB1121-T
D302 1S2837
LOADING MOTER DRIVE
IC305 TA7733F LOADING MOTOR DRIVE
Q308 2SA812 START
Q307 DTC144EK INVERTER
Q322 DTA144EK INVERTER
Q310 DTC114EK CAM DD SWITCH
X301 6MHz
Q317 DTA144EK INVERTER
Q318 FMA2 REC/DEW LED SWITCH
Q328 DTC114EK
IC301 MB88551 SYSTEM CONTROL
Q321 FMA2 CUE/REV SWITCH
Q315 2SB1040 MIV REG
Q316 2SC1623 MIV REG
IC302 (1/4) μPC324G2 MIV REG
Q327 NJL7141E-S TOP SENS
Q326 NJL7141E-S END SENS
Q306 FMW1 END SENS
Q323 FMW1 TOP SENS
IC302 (1/4) μPC324G2 Q301 2SA812 T REEL FG AMP
IC302 (1/4) μPC324G2 Q302 2SA812 S REEL FG AMP
Q324 DTC144EK
Q325 DTC144EK
WDD SWITCH
D305 1S2835
IC302 (1/4) μPC324G2 Q303 2SA812 BATT DOWN DET
D301 HZ5BLL
D308 1SS196
CN306
TO MV-11 BOARD
(See page 119.)
TO MR-8 BOARD CN103
(See page 119.)
CN301
TO MV-11 BOARD CN201
(See page 119.)
TO SS-70 BOARD (1/2) (SERVO)
(See page 127, 129.)
no mark : REC mode
( ) : PB mode
Marked ＊ is not able to measure the voltage of it's position.

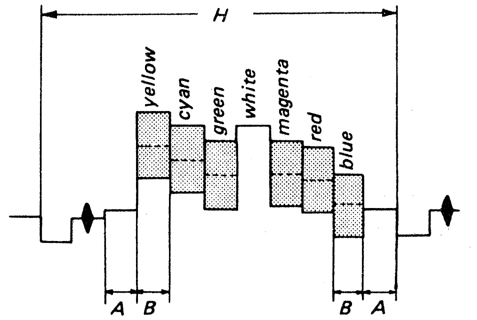
Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- ― : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.


H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A

A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

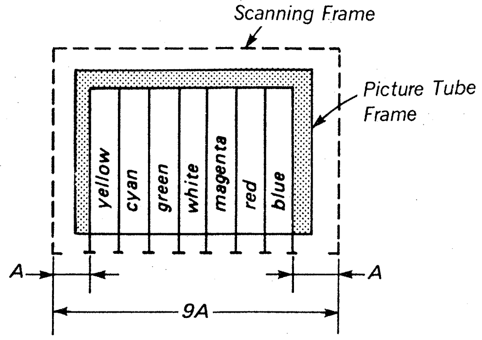

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

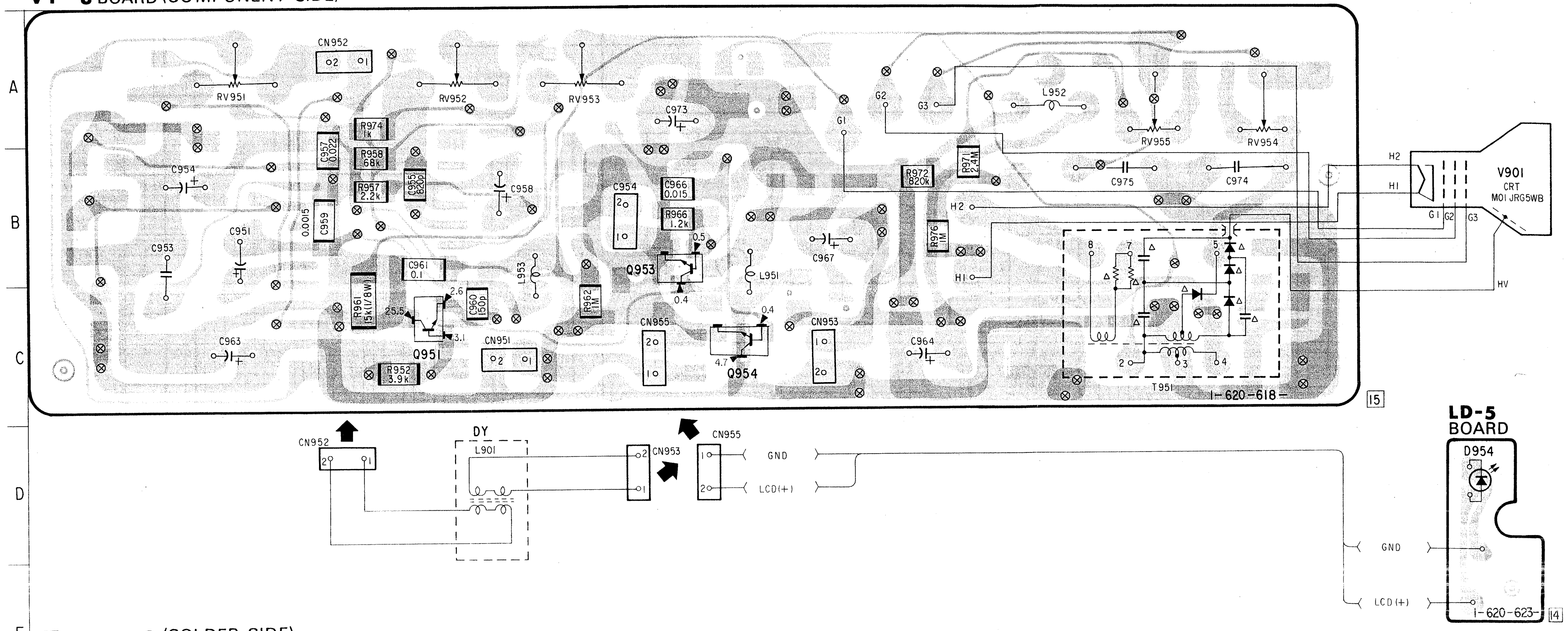
Fig. b Picture of TV monitor screen

VF-8(VIEWFINDER), LD-5(LED) PRINTED WIRING BOARDS

—Ref. No. VF-8 and LD-5 BOARDS: 7,000 Series—

CN951	C-4
CN952	A-3
CN953	C-6
CN955	C-5
D951	H-6
D952	H-6
D953	F-5
IC951	F-3
Q951	C-3
Q952	F-6
Q953	B-5
Q954	C-6
RV951	A-2
RV952	A-4
RV953	A-5
RV954	A-9
RV955	A-9

VF-8 BOARD (COMPONENT SIDE) REC/PB mode


A
B
C
D
E
CN952
RV951
RV952
RV953
RV954
RV955
C973
C954
C958
C953
C951
C961 0.1
C960 150p
C963
C954
C966 0.015
R966 1.2k
C967
C964
C975
C974
L952
L953
L951
R974 1k
R958 68k
R957 2.2k
C957 0.022
C959
0.0015
C955 820p
R961 15k(1/8W)
R962 1M
R952 3.9k
R972 820k
R971 2.4M
R976 1M
Q951
Q953
Q954
CN951
CN955
CN953
G1
G2
G3
H1
H2
T951
1-620-618
15
V901
CRT
M01JRG5WB
HV
DY
L901
GND
LCD(+)
LD-5
BOARD
D954
1-620-623
14

Note:

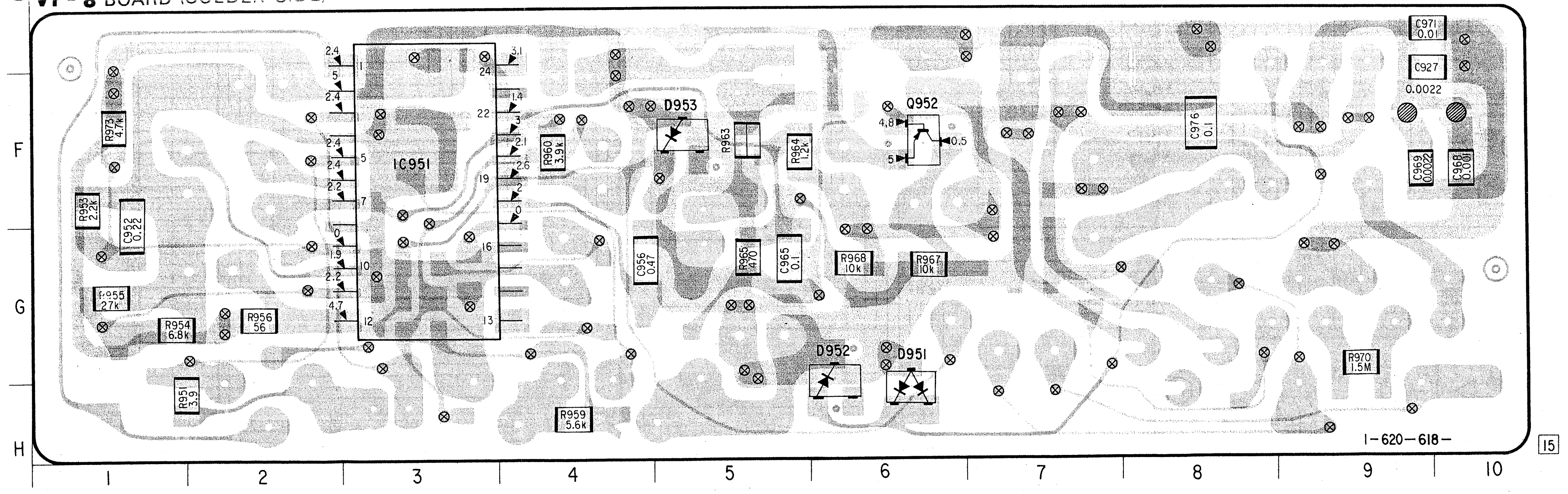
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.

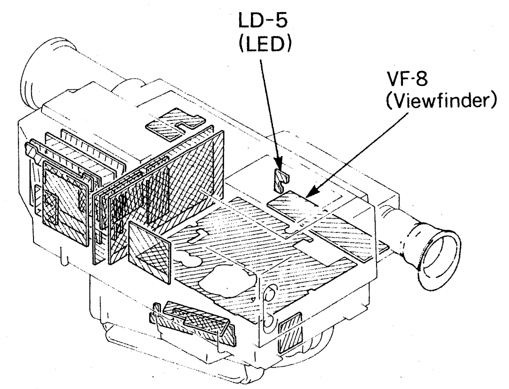
Caution:

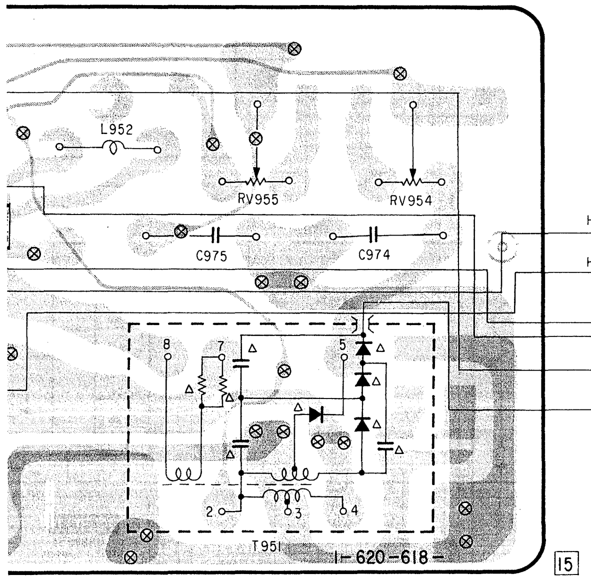
Pattern face side: (Solder Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

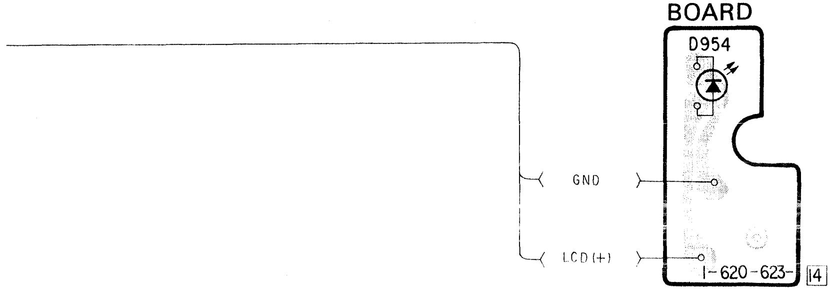
When indicating parts by reference number, please include the board name.

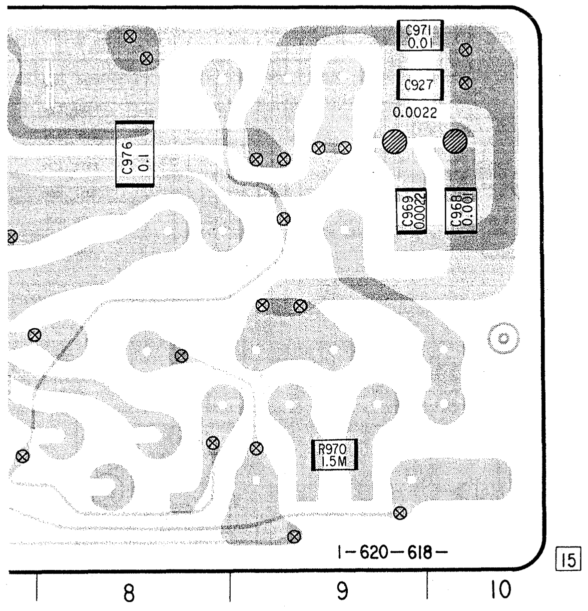
VF-8 BOARD (SOLDER SIDE)


F
G
H
1
2
3
4
5
6
7
8
9
10
IC951
D953
Q952
D952
D951
R973 4.7k
R953 2.2k
C952 0.22
R955 27k
R954 6.8k
R956 56
R951 3.9
R960 3.9k
R963
R964 1.2k
C956 0.47
R965 470
C965 0.1
R968 10k
R967 10k
R959 5.6k
C976 0.1
C971 0.01
C927
0.0022
C969 0.0022
C968 0.001
R970 1.5M
1-620-618
15


LD-5
(LED)
VF-8
(Viewfinder)

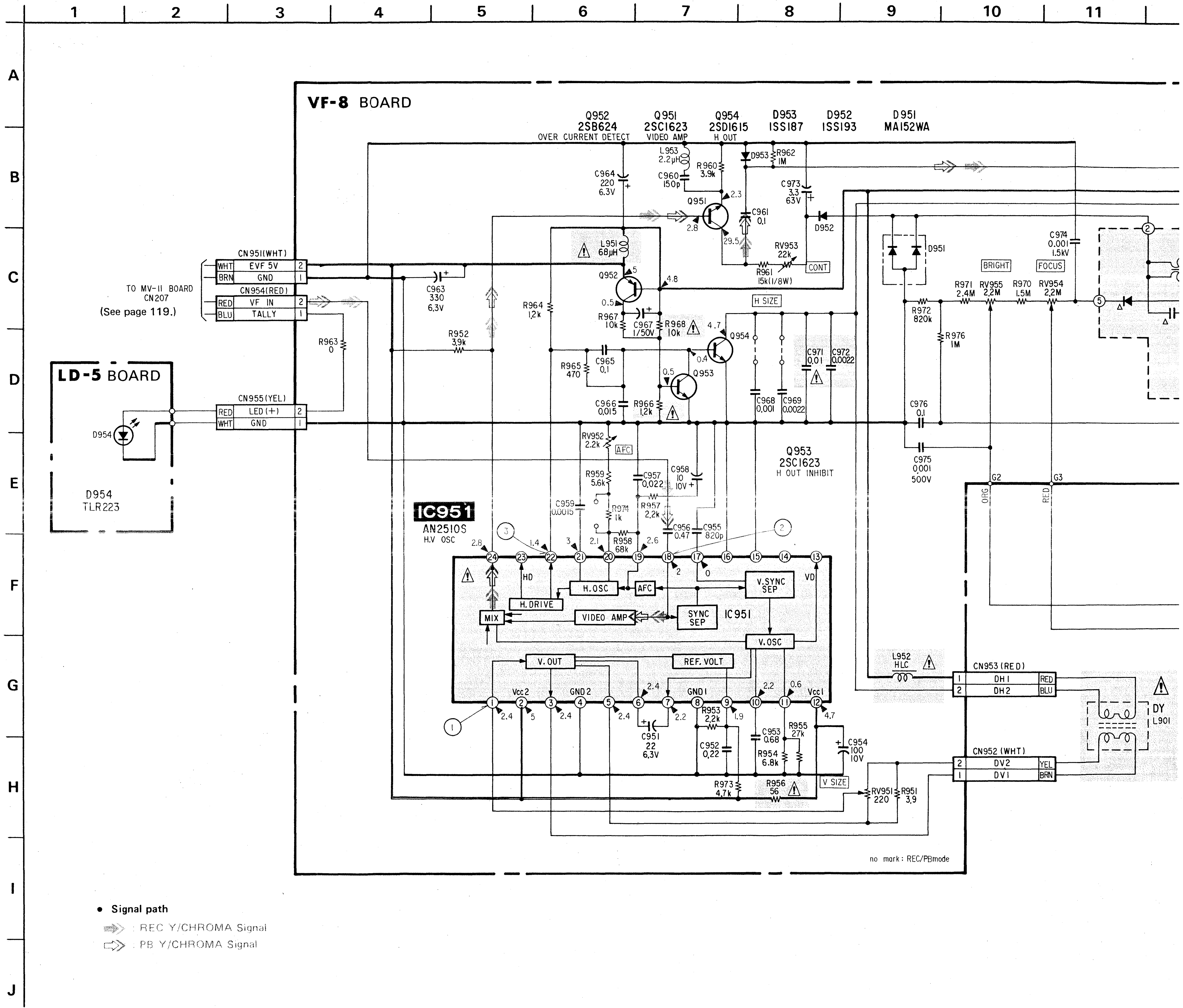

L952
RV955
RV954
C975
C974
H2
H1
V901
CRT
M01JRG5WB
G1
G2
G3
HV
T951
1-620-618
15


LD-5
BOARD
D954
GND
LCD(+)
1-620-623
14


C971
0.01
C927
0.0022
C976
0.1
C969
0.0022
C968
0.001
R970
1.5M
1-620-618
15
8
9
10

VF-8(VIEWFINDER), LD-5(LED) SCHEMATIC DIAGRAM

—Ref. No. VF-8 and LD-5 BOARDS: 7, 000 Series—

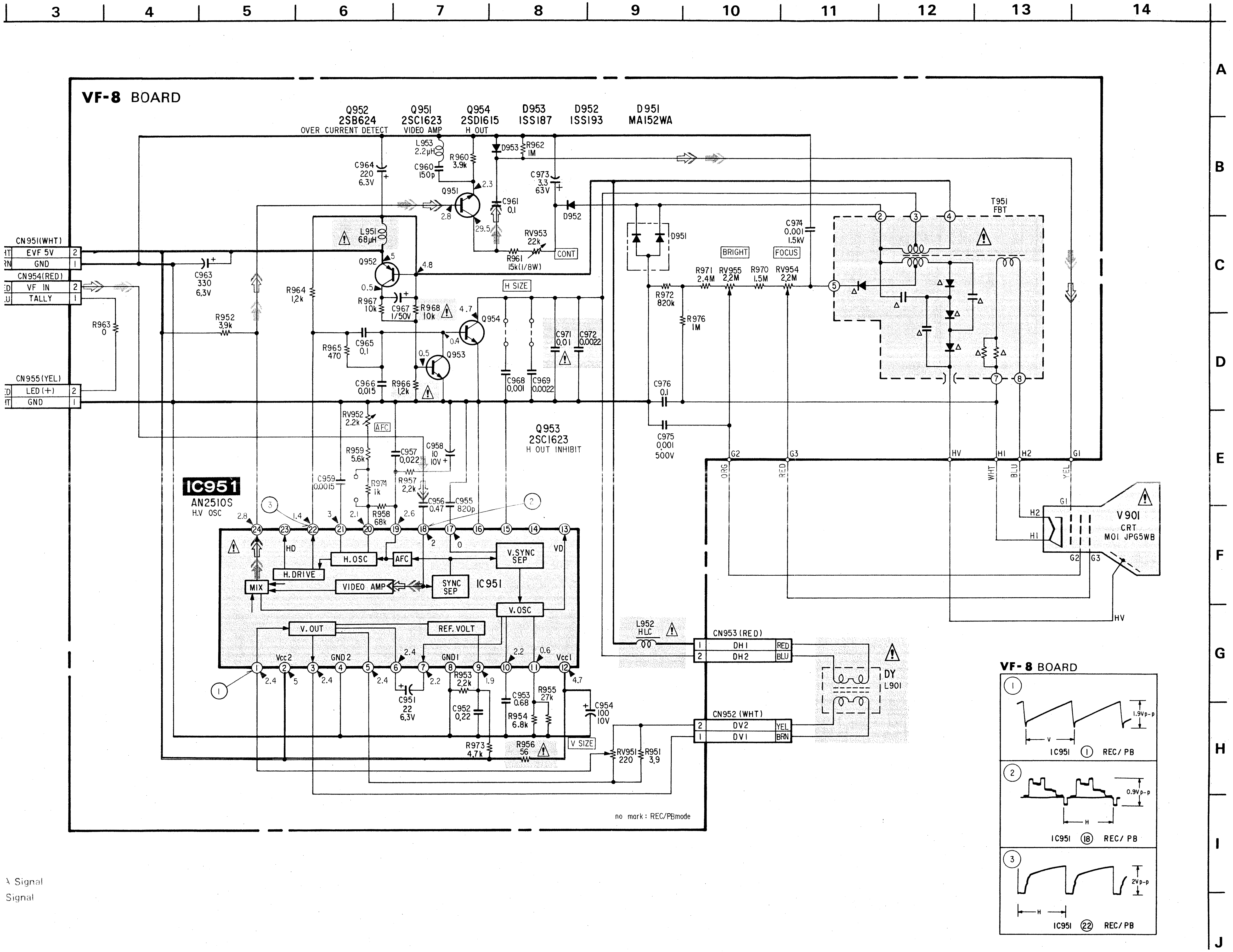

1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
VF-8 BOARD
Q952
2SB624
OVER CURRENT DETECT
Q951
2SC1623
VIDEO AMP
Q954
2SD1615
H OUT
D953
1SS187
D952
1SS193
D951
MA152WA
CN951(WHT)
EVF 5V
GND
CN954(RED)
VF IN
TALLY
CN955(YEL)
LED(+)
GND
TO MV-II BOARD
CN207
(See page 119.)
LD-5 BOARD
D954
TLR223
IC951
AN2510S
H.V OSC
H.OSC
AFC
V.SYNC SEP
H.DRIVE
MIX
VIDEO AMP
SYNC SEP
V.OSC
V.OUT
REF.VOLT
Q953
2SC1623
H OUT INHIBIT
H SIZE
V SIZE
BRIGHT
FOCUS
CONT
L952
HLC
CN953(RED)
DH1
DH2
CN952(WHT)
DV2
DV1
DY
L901
G2
G3
no mark: REC/PB mode

- Signal path

REC Y/CHROMA Signal

PB Y/CHROMA Signal

SCHEMATIC DIAGRAM
7, 000 Series—


3
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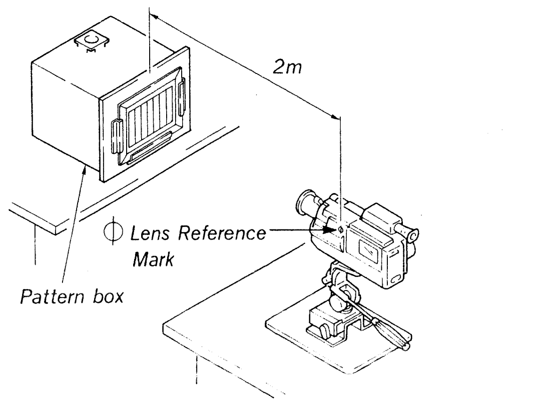
14
A
B
C
D
E
F
G
H
I
J
VF-8 BOARD
Q952 2SB624 OVER CURRENT DETECT
Q951 2SC1623 VIDEO AMP
Q954 2SD1615 H OUT
D953 1SS187
D952 1SS193
D951 MA152WA
Q953 2SC1623 H OUT INHIBIT
CN951(WHT)
EVF 5V
GND
CN954(RED)
VF IN
TALLY
CN955(YEL)
LED(+)
GND
C963 330 6.3V
R952 3.9k
R963 0
R964 1.2k
C964 220 6.3V
L951 68μH
L953 2.2μH
C960 150p
R960 3.9k
D953
R962 1M
C973 3.3 63V
C961 0.1
D952
RV953 22k
CONT
R961 15k(1/8W)
R967 10k
C967 1/50V
R968 10k
H SIZE
R965 470
C965 0.1
C966 0.015
R966 1.2k
C968 0.001
C969 0.0022
C971 0.01
C972 0.0022
RV952 2.2k
AFC
R959 5.6k
C957 0.022
C958 10 10V
C959 0.0015
R974 1k
R957 2.2k
R958 68k
C956 0.47
C955 820p
IC951
AN2510S
H.V OSC
H.OSC
AFC
V.SYNC SEP
H.DRIVE
MIX
VIDEO AMP
SYNC SEP
V.OSC
V.OUT
REF.VOLT
HD
VD
Vcc2
GND2
GND1
Vcc1
C951 22 6.3V
R953 2.2k
C952 0.22
C953 0.68
R955 27k
R954 6.8k
C954 100 10V
R973 4.7k
R956 56
V SIZE
RV951 220
R951 3.9
no mark : REC/PBmode
D951
C974 0.001 1.5kV
BRIGHT
FOCUS
R971 2.4M
RV955 2.2M
R970 1.5M
RV954 2.2M
R972 820k
R976 1M
C976 0.1
C975 0.001 500V
T951 FBT
G2
G3
HV
H1
H2
G1
ORG
RED
WHT
BLU
YEL
V901 CRT M01 JPG5WB
L952 HLC
CN953(RED)
DH1
DH2
RED
BLU
CN952(WHT)
DV2
DV1
YEL
BRN
DY L901
VF-8 BOARD
1.9Vp-p
V
IC951 ① REC/PB
0.9Vp-p
H
IC951 ⑱ REC/PB
2Vp-p
H
IC951 ㉒ REC/PB
Signal
Signal

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ☐ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ☐ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

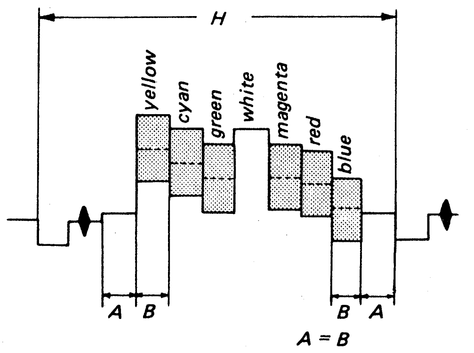


Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

Scanning Frame

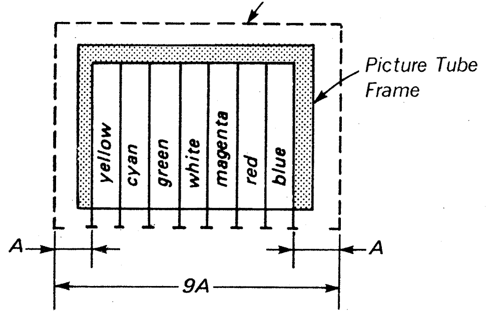
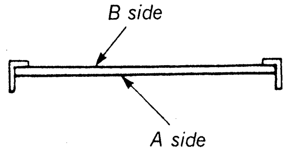

Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

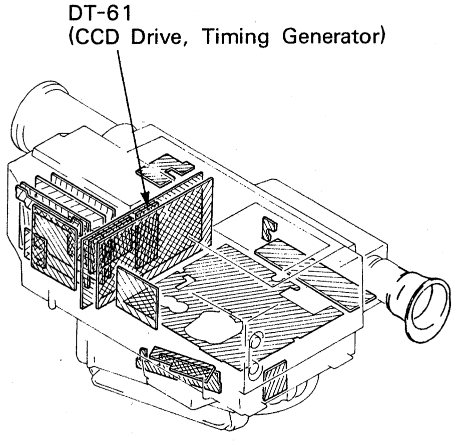
Note:

- ○ : indicates a lead wire mounted on the component side.
- ● : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▩ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.
- ▒ : B+ pattern from the side which enables seeing.
- ▨ : Printed resistor.


B side
A side

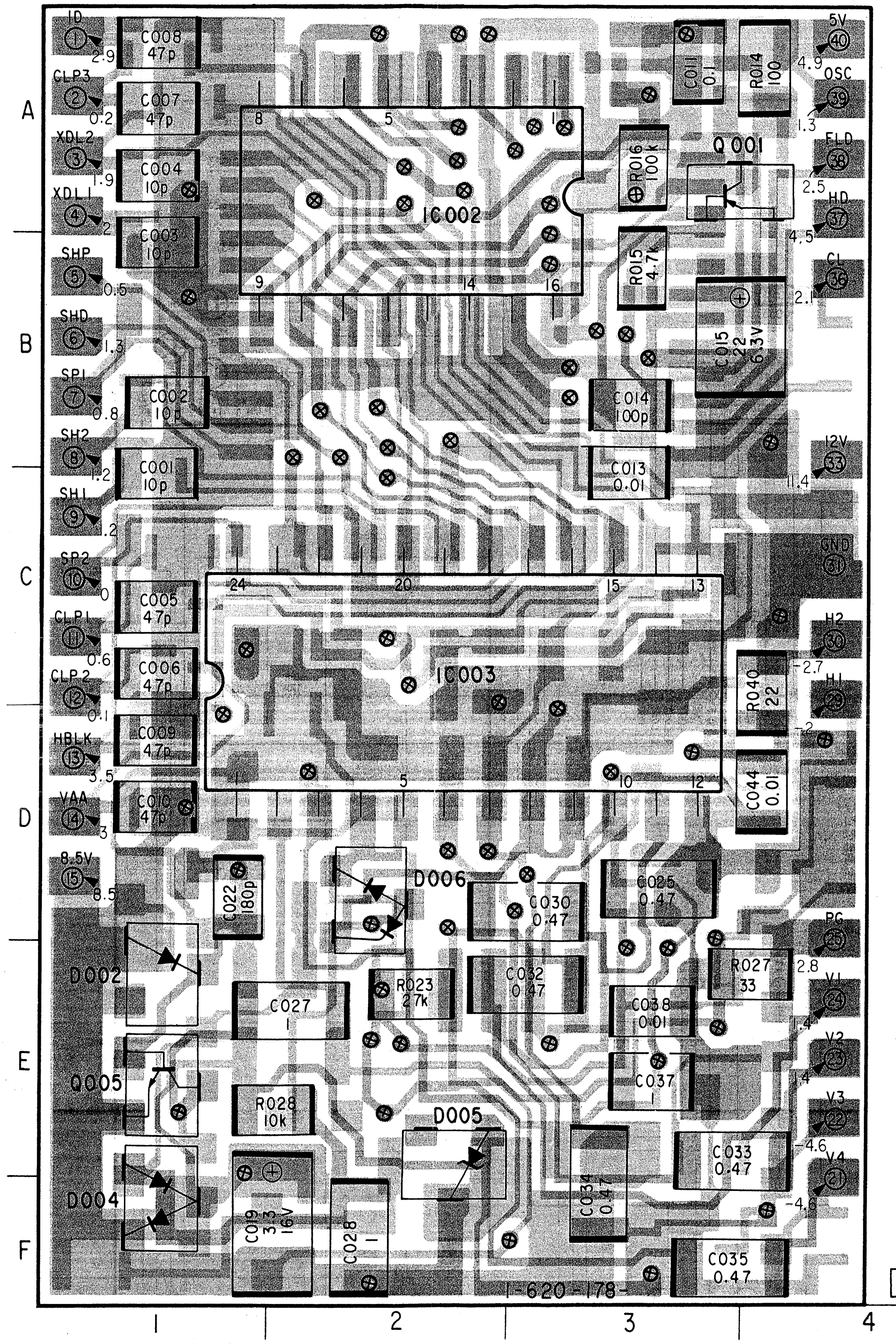
Note
Soldering side : Parts on the soldering side being
(SIDE A) seen from the soldering are stated.
Component side : Parts on the component side being
(SIDE B) seen from the component are stated.
Regarding color indication of patterns

- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.

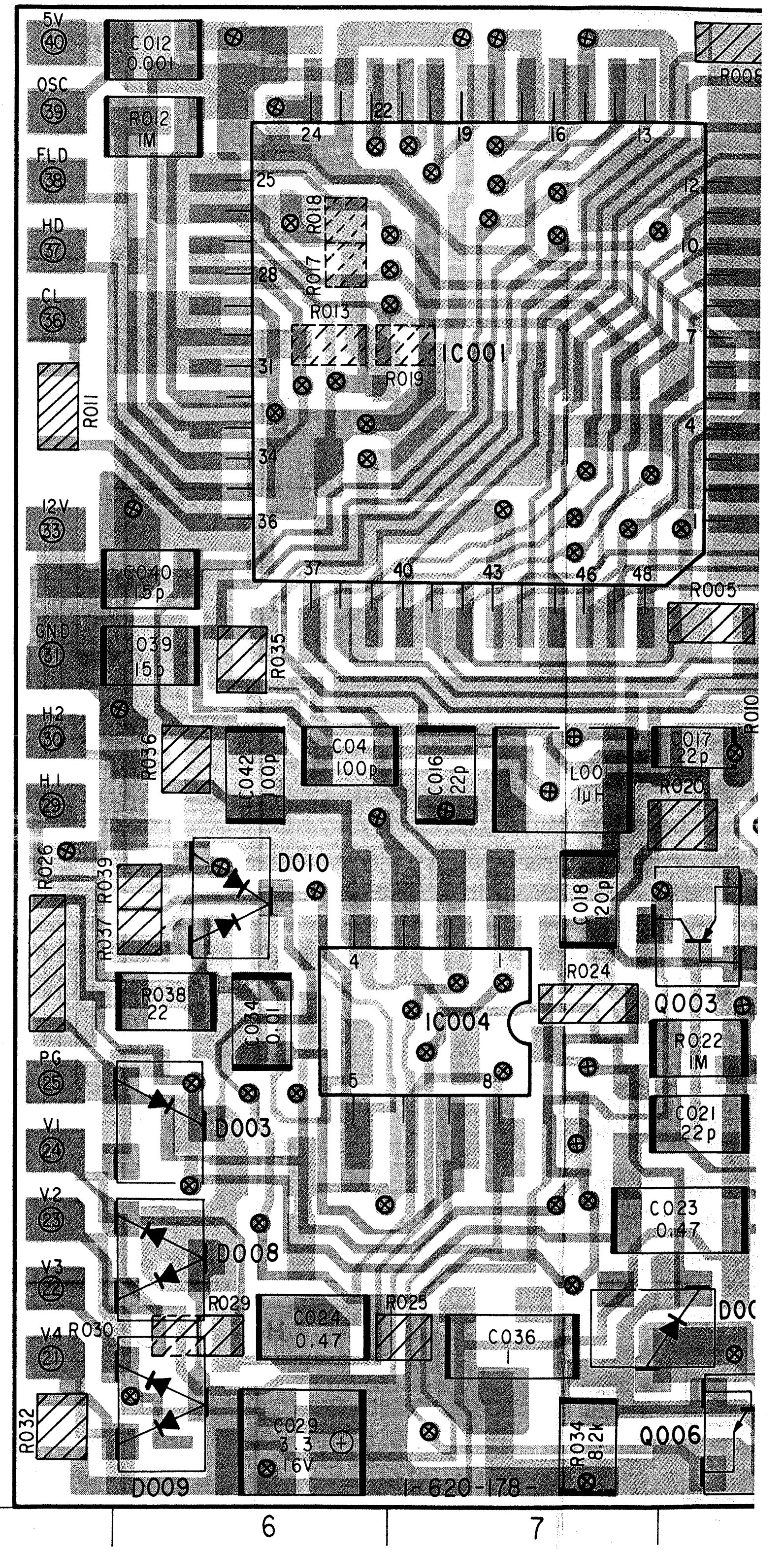

DT-61
(CCD Drive, Timing Generator)

DT-61(CCD DRIVE, TIMING GENERATOR)PRINTED WIRING BOARD

DT-61 BOARD (B SIDE) REC mode


ID
CLP3
XDL2
XDL1
SHP
SHD
SP1
SH2
SH1
SP2
CLP1
CLP2
HBLK
VAA
8.5V
5V
OSC
FLD
HD
CL
12V
GND
H2
H1
PG
V1
V2
V3
V4
C008 47p
C007 47p
C004 10p
C003 10p
C002 10p
C001 10p
C005 47p
C006 47p
C009 47p
C010 47p
C011 0.1
R014 100
R016 100k
Q001
R015 4.7k
C015 22 6.3V
C014 100p
C013 0.01
IC002
IC003
R040 22
C044 0.01
D002
D004
D005
D006
Q005
C022 180p
C027 1
R023 27k
C030 0.47
C032 0.47
C025 0.47
R027 33
C038 0.01
C037
R028 10k
C019 3.3 16V
C028 1
C034 0.47
C033 0.47
C035 0.47
1-620-178-
11
A
B
C
D
E
F
1
2
3
4

DT-61 BOARD (A SIDE)

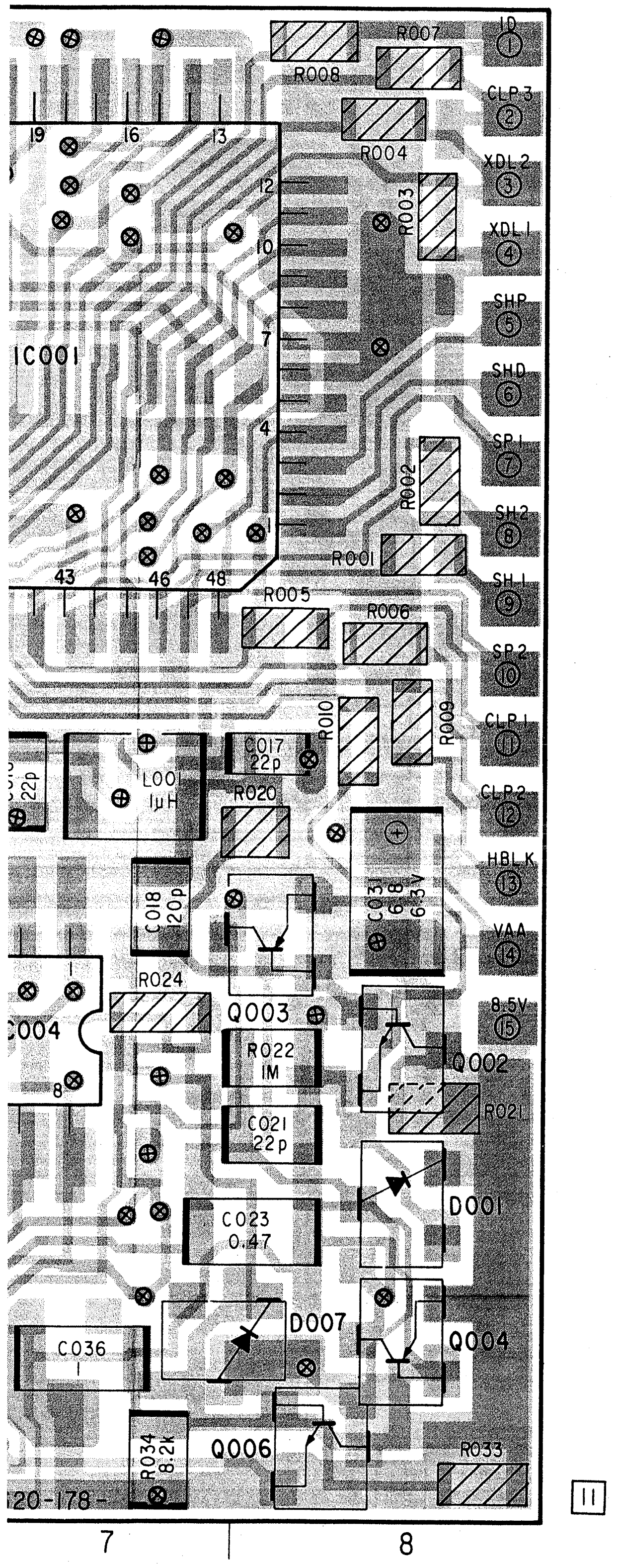

5V
OSC
FLD
HD
CL
12V
GND
H2
H1
PG
V1
V2
V3
V4
C012 0.001
R012 1M
R018
R017
R013
R019
IC001
R011
C040 15p
C039 15p
R035
R036
C042 100p
C041 100p
C016 22p
L001 1μH
R017
R020
R005
R026
R039
R037
D010
C018 20p
R038 22
C034 0.01
IC004
R024
Q003
R022 1M
C021 22p
D003
D008
C023 0.47
R029
R030
C024 0.47
R025
C036 1
R032
D009
C029 3.3 16V
R034 8.2k
Q006
1-620-178-
5
6
7

Be sure to always read "Note on replacing the CCD imager block" in page 86 when replacing the VC-20 complete board. DT-61 complete board, and CCD imager block (IC701 on the VC-20 board and IC002 on the DT-61 board).

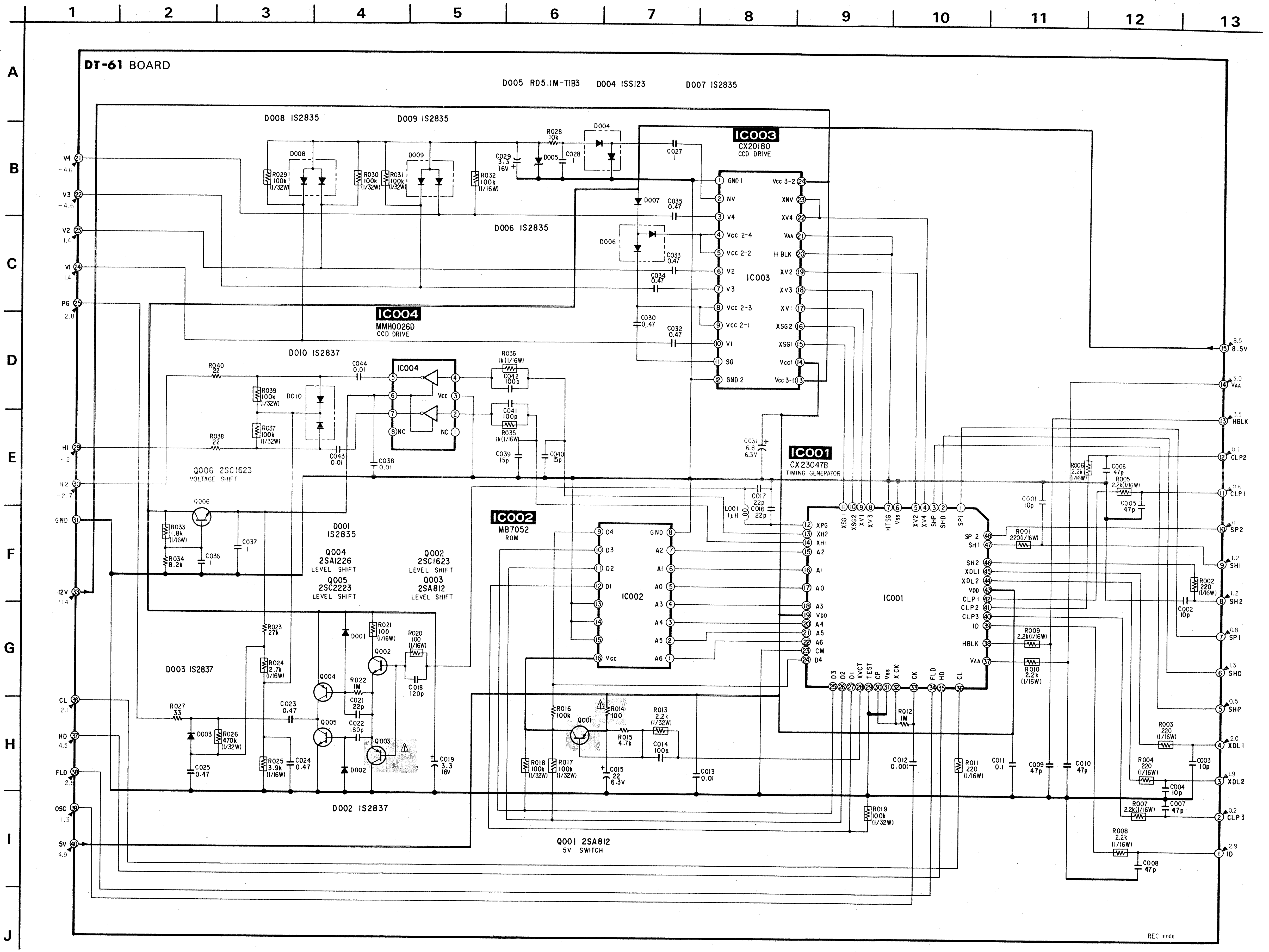
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants ide marque ⚠ sont criti remplacer que par spécifié.

DT-61(CCD DRIVE, TIMING GENERATOR)SCHEMATIC DIAGRAM



ID
CLP3
XDL2
XDL1
SHP
SHD
SP1
SH2
SH1
SP2
CLP1
CLP2
HBLK
VAA
8.5V
R007
R008
R004
R003
R002
R001
R005
R006
R010
R009
IC001
43
46
48
19
16
13
12
10
7
4
1
L001 1μH
C017 22p
R020
C018 20p
C031 6.8 6.3V
Q003
R024
R022 1M
C021 22p
Q002
R021
C023 0.47
D001
D007
Q004
C036 1
R034 8.2k
Q006
R033
IC004
120-178-
7
8
11



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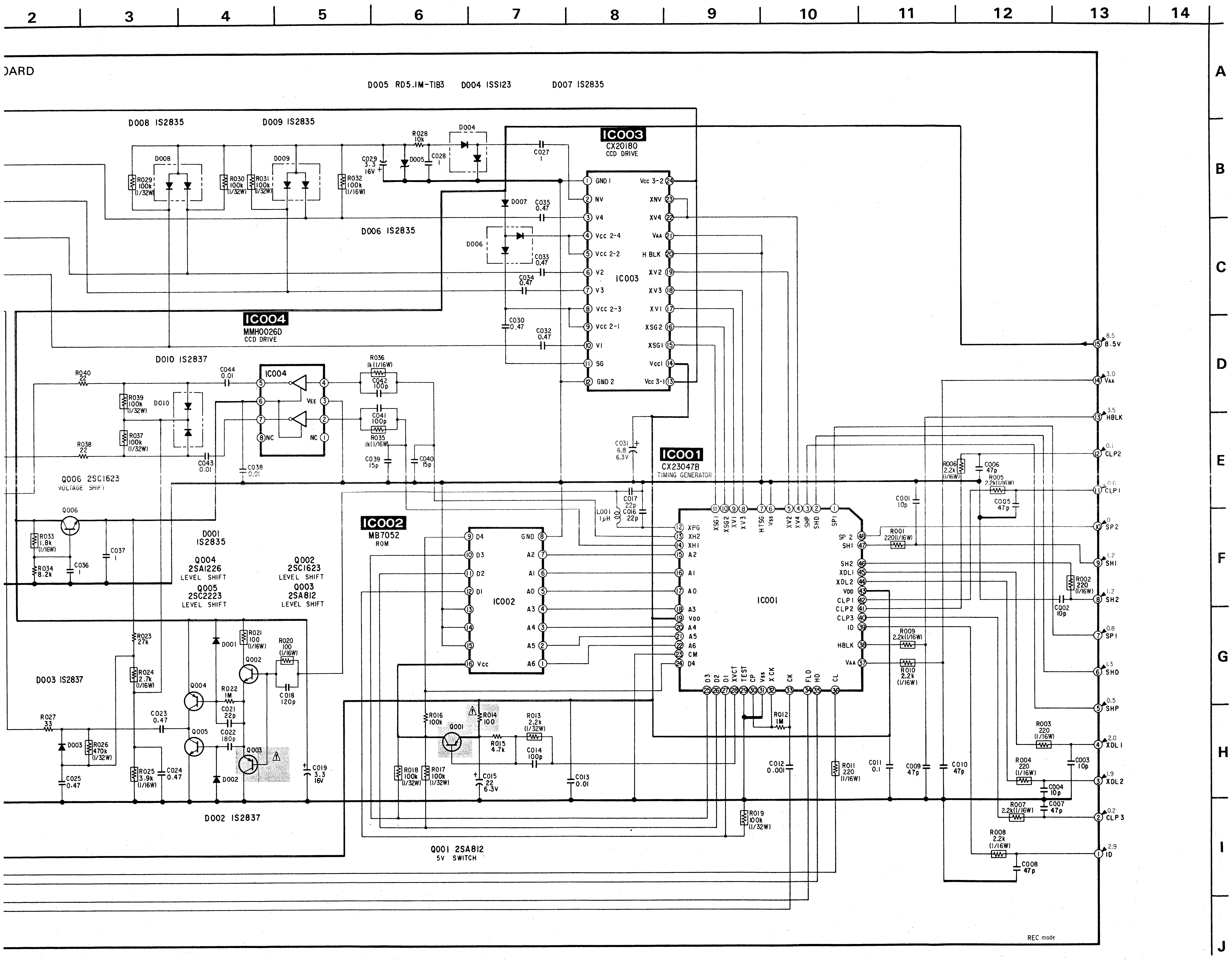
A
B
C
D
E
F
G
H
I
J
DT-61 BOARD
D005 RD5.1M-TIB3
D004 1SS123
D007 1S2835
D008 1S2835
D009 1S2835
D006 1S2835
D010 1S2837
IC003
CX20180
CCD DRIVE
IC004
MMH0026D
CCD DRIVE
IC001
CX23047B
TIMING GENERATOR
IC002
MB7052
ROM
Q006 2SC1623
VOLTAGE SHIFT
D001
1S2835
Q004
2SA1226
LEVEL SHIFT
Q005
2SC2223
LEVEL SHIFT
Q002
2SC1623
LEVEL SHIFT
Q003
2SA812
LEVEL SHIFT
D003 1S2837
D002 1S2837
Q001 2SA812
5V SWITCH
V4 -4.6
V3 -4.6
V2 1.4
V1 1.4
PG 2.8
H1 -2
H2 -2.7
GND
12V 11.4
CL 2.1
HD 4.5
FLD 2.5
OSC 1.3
5V 4.9
8.5V
VAA 3.0
HBLK 3.5
CLP2
CLP1
SP2
SH1 1.2
SH2 1.2
SP1 0.8
SHD 1.3
SHP 0.5
XDL1 2.0
XDL2 1.9
CLP3 0.2
ID 2.9
REC mode

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TIMING GENERATOR) SCHEMATIC DIAGRAM



2
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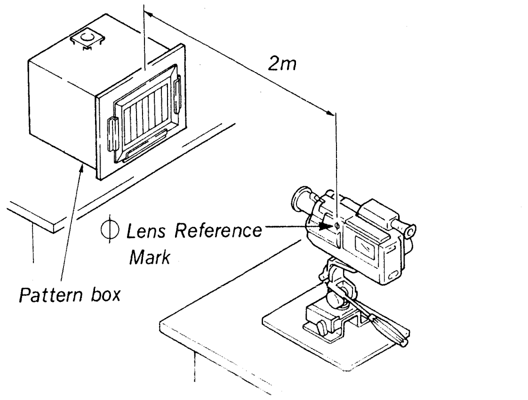
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
)ARD
D005 RD5.IM-TIB3
D004 ISS123
D007 IS2835
D008 IS2835
D009 IS2835
D006 IS2835
IC003
CX20180
CCD DRIVE
IC004
MMH0026D
CCD DRIVE
D010 IS2837
IC001
CX23047B
TIMING GENERATOR
IC002
MB7052
ROM
Q006 2SC1623
VOLTAGE SHIFT
D001
IS2835
Q004
2SA1226
LEVEL SHIFT
Q005
2SC2223
LEVEL SHIFT
Q002
2SC1623
LEVEL SHIFT
Q003
2SA812
LEVEL SHIFT
D003 IS2837
D002 IS2837
Q001 2SA812
5V SWITCH
R028 10k
C029 3.3 16V
C028 1
C027 1
R029 100k (1/32W)
R030 100k (1/32W)
R031 100k (1/32W)
R032 100k (1/16W)
C035 0.47
C033 0.47
C034 0.47
C030 0.47
C032 0.47
R040 22
R039 100k (1/32W)
R037 100k (1/32W)
R038 22
C044 0.01
C043 0.01
C038 0.01
R036 1k(1/16W)
C042 100p
C041 100p
R035 1k(1/16W)
C039 15p
C040 15p
C031 6.8 6.3V
L001 1µH
C017 22p
C016 22p
R033 1.8k (1/16W)
R034 8.2k
C036 1
C037 1
R023 27k
R024 2.7k (1/16W)
R021 100 (1/16W)
R020 100 (1/16W)
R022 1M
C021 22p
C022 180p
C018 120p
R027 33
R026 470k (1/32W)
C023 0.47
R025 3.9k (1/16W)
C024 0.47
C025 0.47
C019 3.3 16V
R016 100k
R014 100
R013 2.2k (1/32W)
R015 4.7k
C014 100p
R018 100k (1/32W)
R017 100k (1/32W)
C015 22 6.3V
C013 0.01
R012 1M
C012 0.001
R011 220 (1/16W)
C011 0.1
C009 47p
C010 47p
R019 100k (1/32W)
R001 220(1/16W)
C001 10p
R006 2.2k (1/16W)
C006 47p
R005 2.2k(1/16W)
C005 47p
R002 220 (1/16W)
C002 10p
R009 2.2k(1/16W)
R010 2.2k (1/16W)
R003 220 (1/16W)
R004 220 (1/16W)
C003 10p
C004 10p
R007 2.2k(1/16W)
C007 47p
R008 2.2k (1/16W)
C008 47p
GND 1
NV
V4
Vcc 2-4
Vcc 2-2
V2
V3
Vcc 2-3
Vcc 2-1
V1
SG
GND 2
Vcc 3-2
XNV
XV4
VAA
H BLK
XV2
XV3
XV1
XSG2
XSG1
Vcc1
Vcc 3-1
VEE
NC
D4
D3
D2
D1
Vcc
GND
A2
A1
A0
A3
A4
A5
A6
XPG
XH2
XH1
VDD
CM
SP 2
SH1
SH2
XDL1
XDL2
CLP1
CLP2
CLP3
ID
HBLK
XSG1
XSG2
XV1
XV3
HTSG
VSS
XV2
XV4
SHP
SHD
SP1
D3
D2
D1
XVCT
TEST
CP
VSS
X CK
CK
FLD
HD
CL
8.5
⑮ 8.5V
3.0
⑭ VAA
3.5
⑬ HBLK
0.1
⑫ CLP2
0.6
⑪ CLP1
0
⑩ SP2
1.2
⑨ SH1
1.2
⑧ SH2
0.8
⑦ SP1
1.3
⑥ SHD
0.5
⑤ SHP
2.0
④ XDL1
1.9
③ XDL2
0.2
② CLP3
2.9
① ID
REC mode

Note:

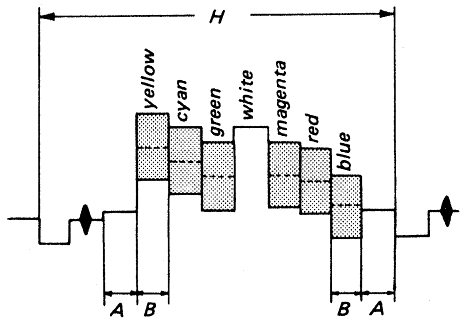
- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ⊡ : Nonflammable resistor
- —— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection



2m
Lens Reference Mark
Pattern box

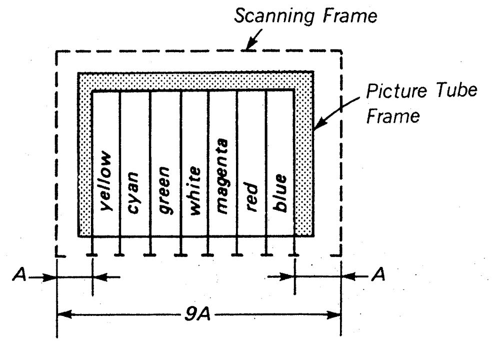
2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.



H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A

A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.



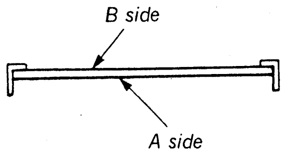
Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

SH-2(CAMERA PROCESS)PRINTED WIRING BOARD

Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▩ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▩ : B+ pattern from the side which enables seeing.
- ▨ : Printed resistor.


B side
A side

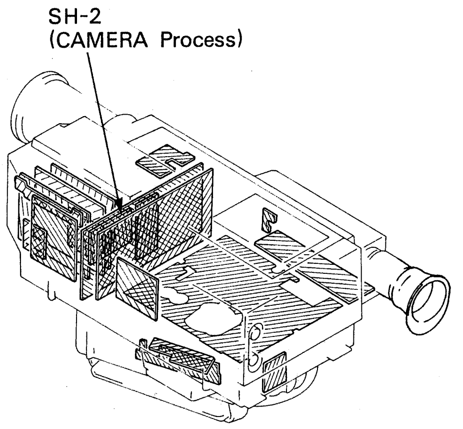
Note

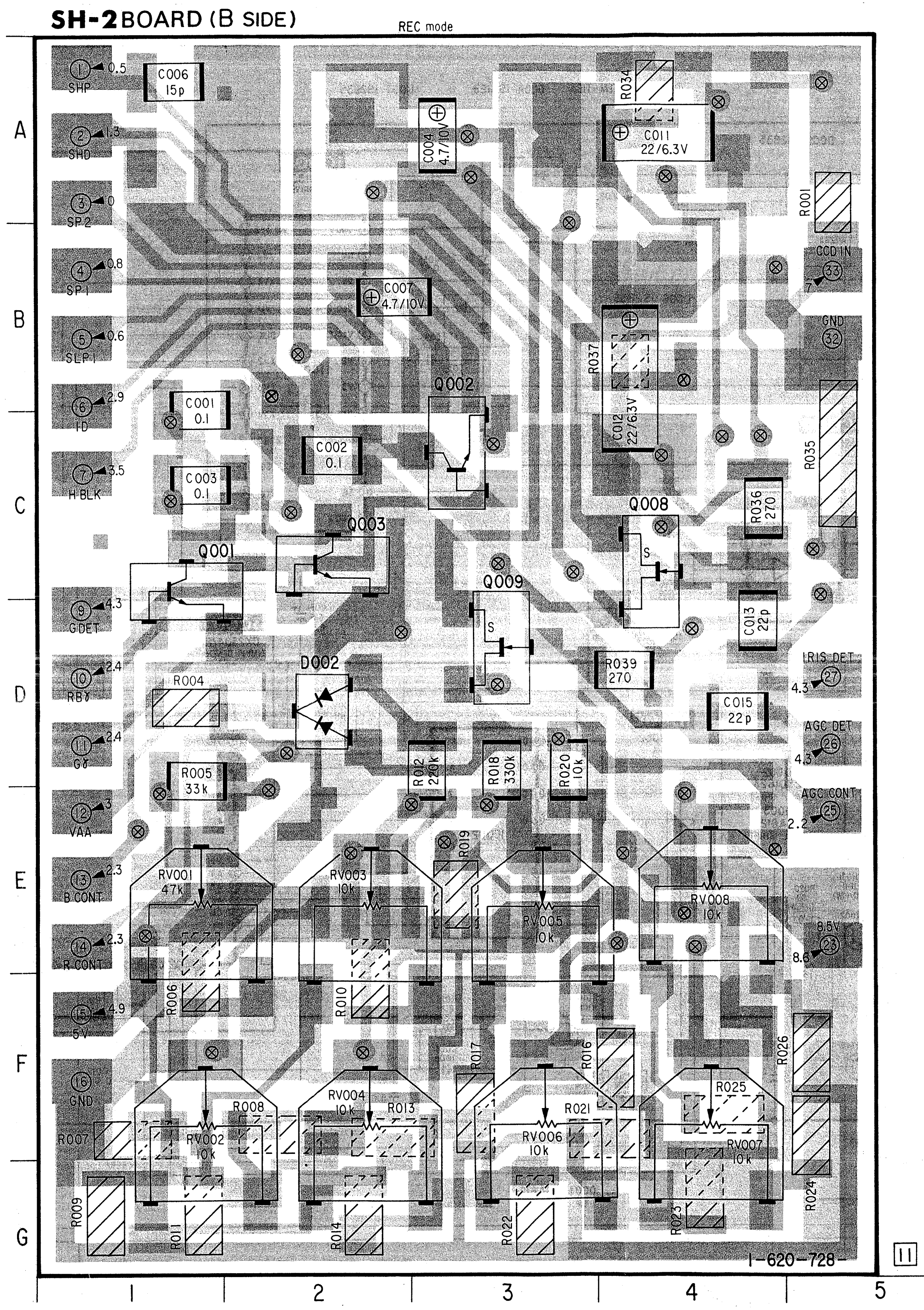
Soldering side (SIDE A) : Parts on the soldering side being seen from the soldering are stated.

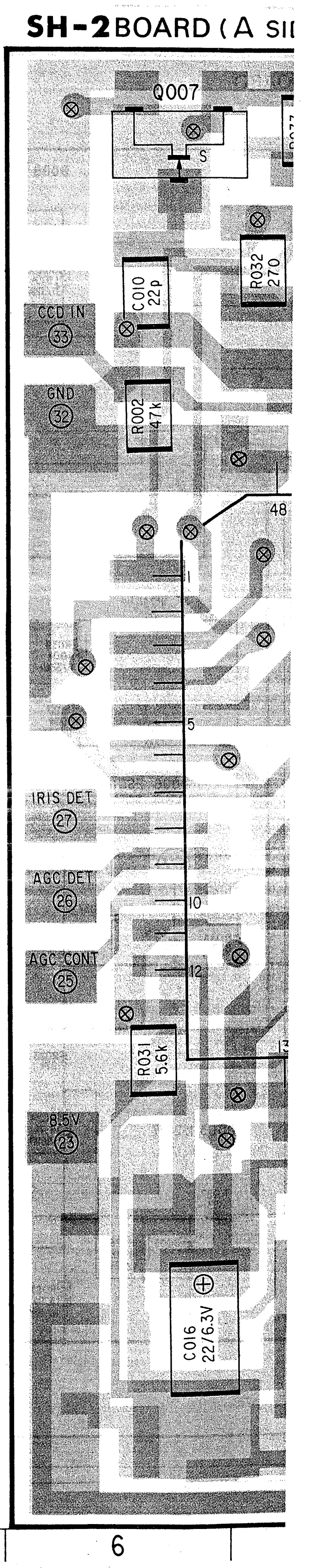
Component side (SIDE B) : Parts on the component side being seen from the component are stated.

Regarding color indication of patterns

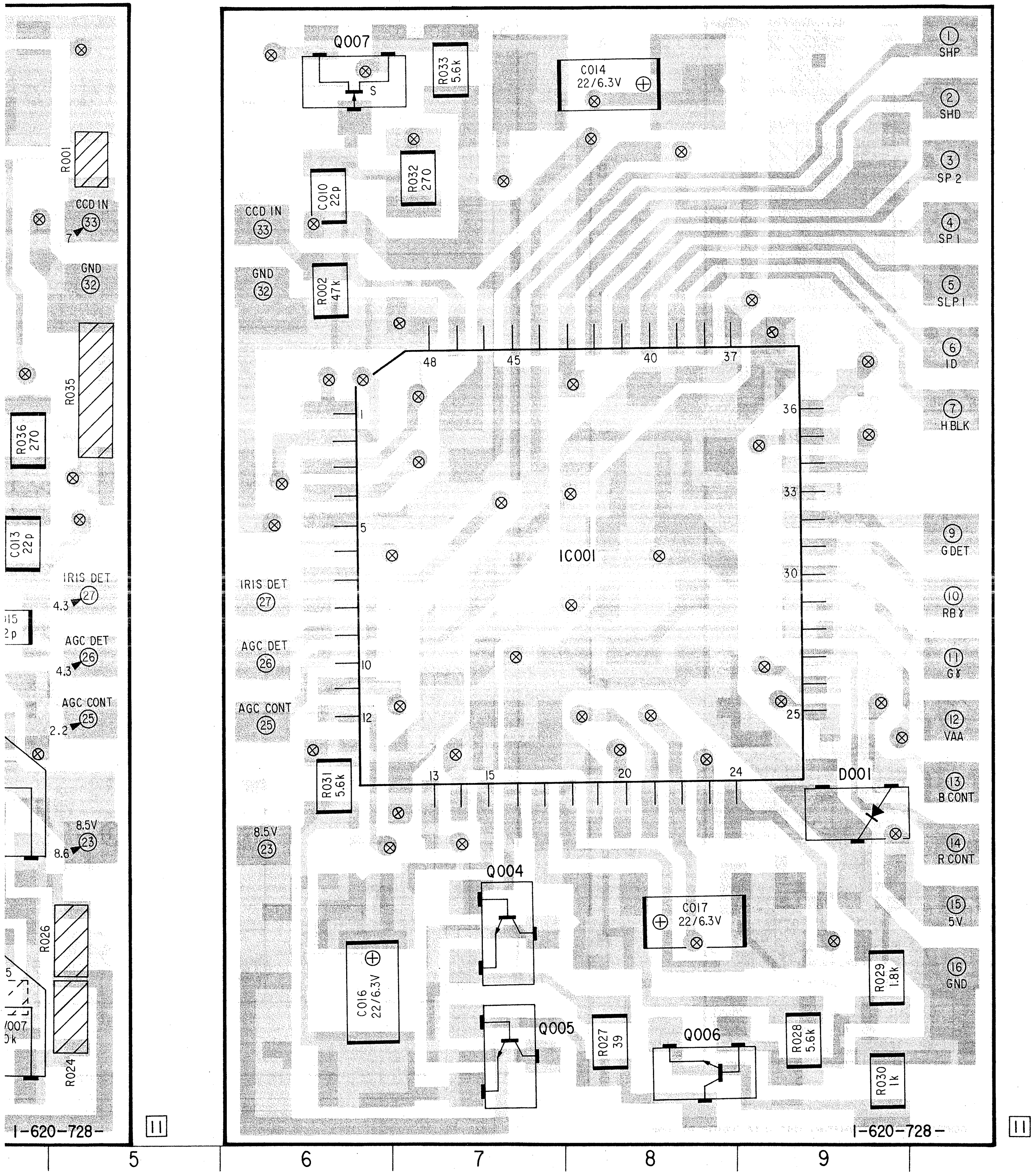
- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.


SH-2
(CAMERA Process)

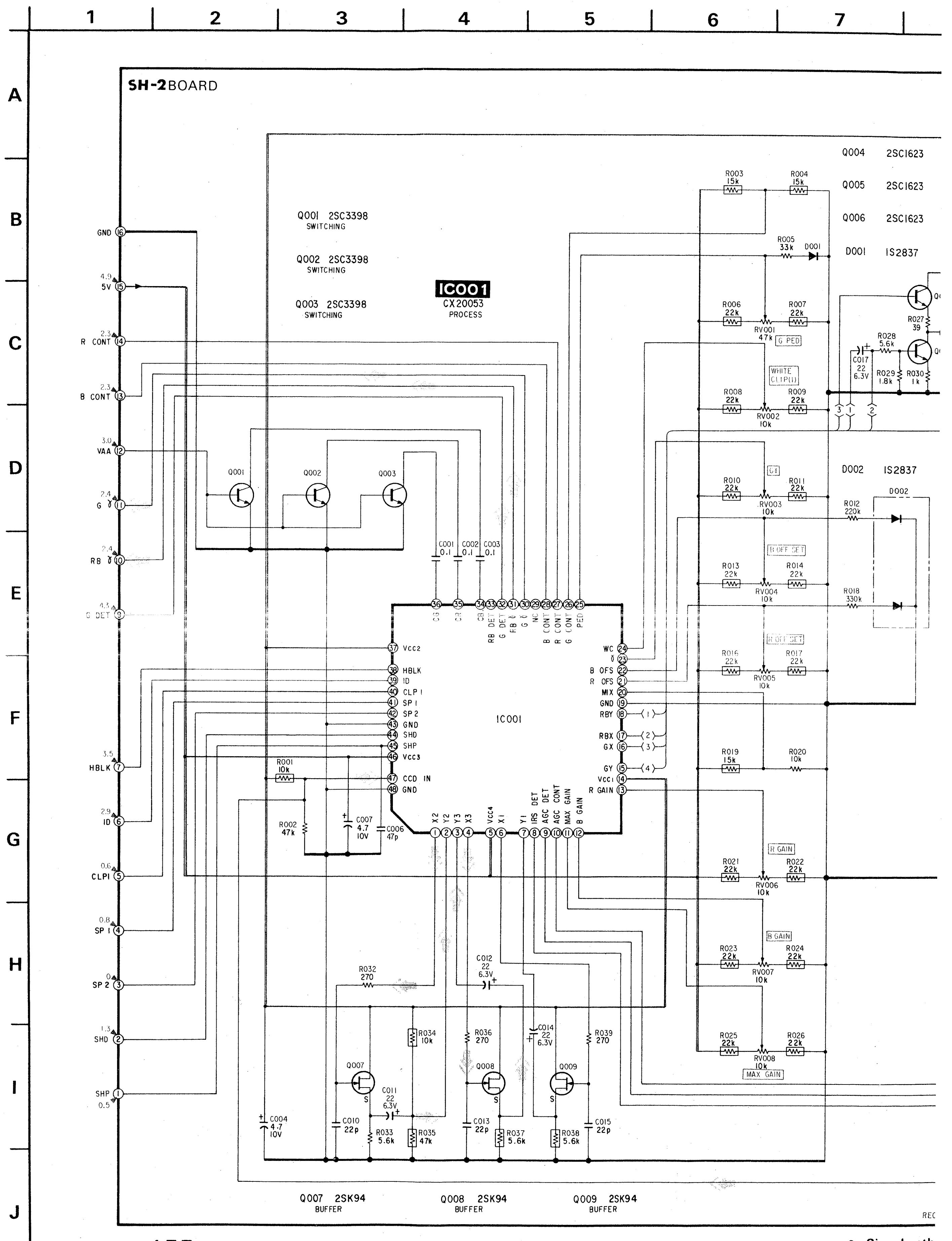

SH-2BOARD (B SIDE)
REC mode
A
B
C
D
E
F
G
1
2
3
4
5
① 0.5 SHP
② 1.3 SHD
③ 0 SP2
④ 0.8 SP1
⑤ 0.6 SLP1
⑥ 2.9 ID
⑦ 3.5 H BLK
⑨ 4.3 G DET
⑩ 2.4 RBØ
⑪ 2.4 GØ
⑫ 3 VAA
⑬ 2.3 B CONT
⑭ 2.3 R CONT
⑮ 4.9 5V
⑯ GND
C006 15p
C004 4.7/10V
C011 22/6.3V
R034
R001
C007 4.7/10V
CCD IN ㉝
GND ㉜
R037
C012 22/6.3V
C001 0.1
C002 0.1
C003 0.1
Q002
Q003
Q001
R035
R036 270
Q008
Q009
C013 22p
R039 270
D002
R004
IRIS DET ㉗ 4.3
C015 22p
AGC DET ㉖ 4.3
R005 33k
R012 220k
R018 330k
R020 10k
AGC CONT ㉕ 2.2
R019
RV001 47k
RV003 10k
RV005 10k
RV008 10k
8.5V ㉓ 8.6
R006
R010
R017
R016
R026
RV004 10k
R008
R013
R021
R025
R007
RV002 10k
RV006 10k
RV007 10k
R009
R011
R014
R022
R023
R024
1-620-728-
11


SH-2BOARD (A SI
Q007
S
C010 22p
R032 270
CCD IN ㉝
GND ㉜
R002 47k
48
1
5
IRIS DET ㉗
AGC DET ㉖
10
AGC CONT ㉕
12
R031 5.6k
8.5V ㉓
C016 22/6.3V
6

SH-2 BOARD (A SIDE)

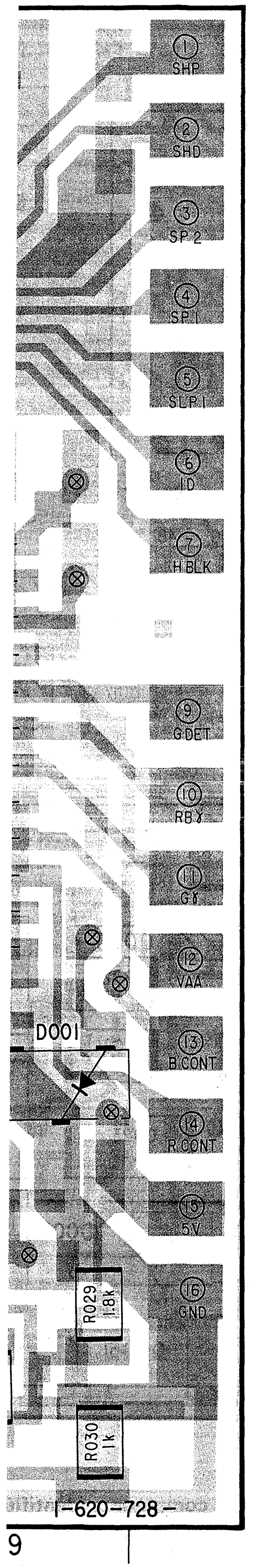

Q007
R033 5.6k
C014 22/6.3V
C010 22p
R032 270
R002 47k
CCD IN 33
GND 32
IRIS DET 27
AGC DET 26
AGC CONT 25
8.5V 23
IC001
D001
R031 5.6k
Q004
Q005
Q006
C017 22/6.3V
C016 22/6.3V
R027 39
R028 5.6k
R029 1.8k
R030 1k
1 SHP
2 SHD
3 SP 2
4 SP 1
5 SLP I
6 ID
7 H BLK
9 G DET
10 RBγ
11 Gγ
12 VAA
13 B CONT
14 R CONT
15 5V
16 GND
R001
R035
R036 270
C013 22p
R026
R024
RV007
1-620-728-
11
5
6
7
8
9

SH-2(CAMERA PROCESS)SCHEMATIC DIAGRAM


SH-2 BOARD
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
Q001 2SC3398 SWITCHING
Q002 2SC3398 SWITCHING
Q003 2SC3398 SWITCHING
IC001 CX20053 PROCESS
Q004 2SC1623
Q005 2SC1623
Q006 2SC1623
D001 1S2837
D002 1S2837
Q007 2SK94 BUFFER
Q008 2SK94 BUFFER
Q009 2SK94 BUFFER
GND
5V
R CONT
B CONT
VAA
G
RB
G DET
HBLK
ID
CLPI
SP 1
SP 2
SHD
SHP
G PED
WHITE CLIP
B OFFSET
R OFFSET
R GAIN
B GAIN
MAX GAIN
IC001

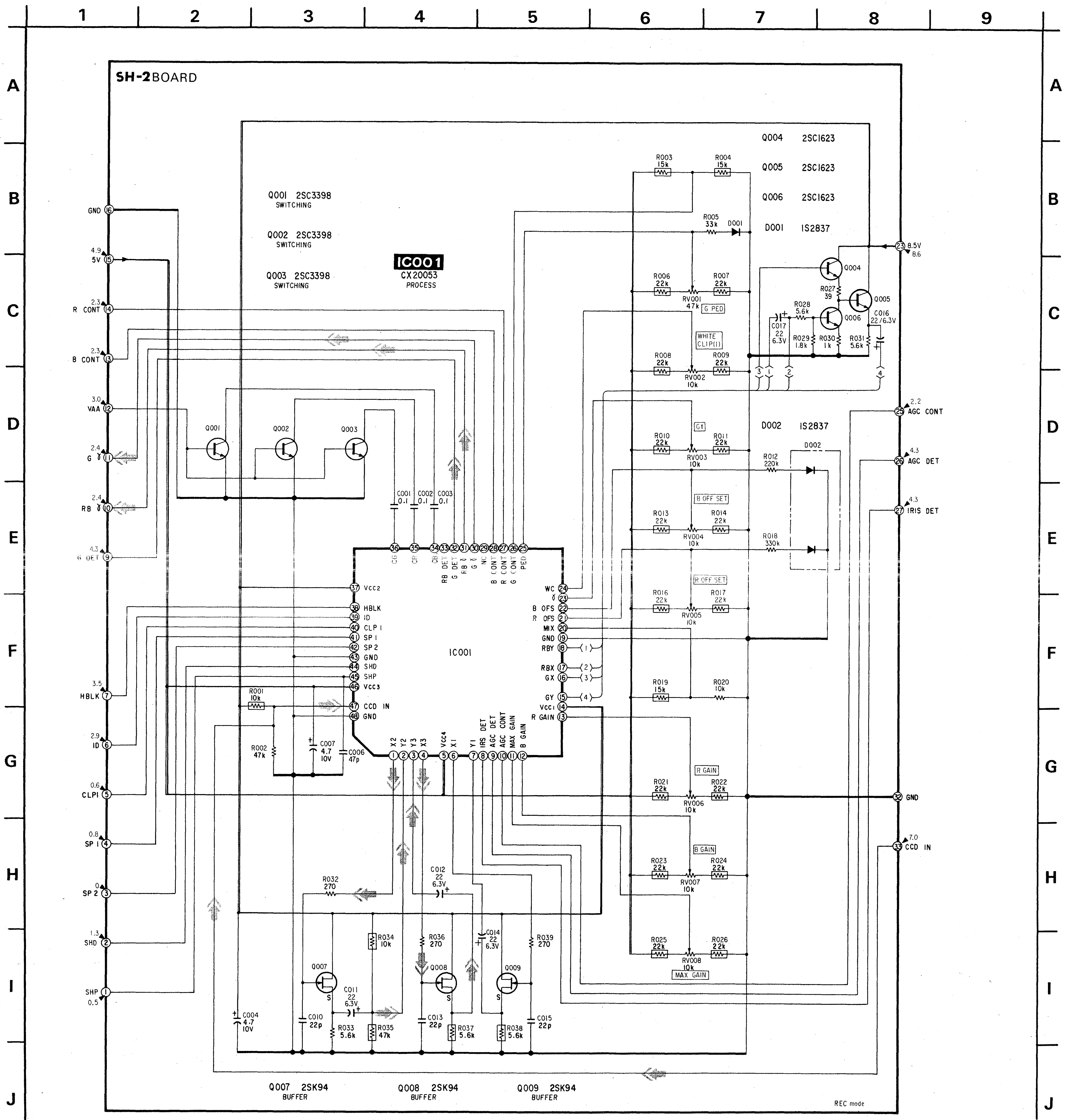
- Signal path

REC Y


① SHP
② SHD
③ SP 2
④ SP 1
⑤ SLP I
⑥ ID
⑦ H BLK
⑨ G DET
⑩ RB X
⑪ G Y
⑫ VAA
⑬ B CONT
⑭ R CONT
⑮ 5V
⑯ GND
D001
R029 1.8k
R030 1k
1-620-728-
9

[11]

SH-2(CAMERA PROCESS) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
SH-2 BOARD
IC001
CX20053
PROCESS
Q001 2SC3398 SWITCHING
Q002 2SC3398 SWITCHING
Q003 2SC3398 SWITCHING
Q004 2SC1623
Q005 2SC1623
Q006 2SC1623
D001 1S2837
D002 1S2837
Q007 2SK94 BUFFER
Q008 2SK94 BUFFER
Q009 2SK94 BUFFER
GND ⑯
4.9 5V ⑮
2.3 R CONT ⑭
2.3 B CONT ⑬
3.0 VAA ⑫
2.4 G Y ⑪
2.4 RB X ⑩
4.3 G DET ⑨
3.5 HBLK ⑦
2.9 ID ⑥
0.6 CLPI ⑤
0.8 SP I ④
0 SP 2 ③
1.3 SHD ②
SHP ① 0.5
㉓ 8.5V 8.6
2.2 ㉕ AGC CONT
4.3 ㉖ AGC DET
4.3 ㉗ IRIS DET
㉜ GND
7.0 ㉝ CCD IN
G PED
WHITE CLIP(1)
G1
B OFF SET
R OFF SET
R GAIN
B GAIN
MAX GAIN
RV001 47k
RV002 10k
RV003 10k
RV004 10k
RV005 10k
RV006 10k
RV007 10k
RV008 10k
R001 10k
R002 47k
R003 15k
R004 15k
R005 33k
R006 22k
R007 22k
R008 22k
R009 22k
R010 22k
R011 22k
R012 220k
R013 22k
R014 22k
R016 22k
R017 22k
R018 330k
R019 15k
R020 10k
R021 22k
R022 22k
R023 22k
R024 22k
R025 22k
R026 22k
R027 39
R028 5.6k
R029 1.8k
R030 1k
R031 5.6k
R032 270
R033 5.6k
R034 10k
R035 47k
R036 270
R037 5.6k
R038 5.6k
R039 270
C001 0.1
C002 0.1
C003 0.1
C004 4.7 10V
C006 47p
C007 4.7 10V
C010 22p
C011 22 6.3V
C012 22 6.3V
C013 22p
C014 22 6.3V
C015 22p
C016 22/6.3V
C017 22 6.3V
VCC2
HBLK
ID
CLP I
SP I
SP 2
GND
SHD
SHP
VCC3
CCD IN
GND
WC
B OFS
R OFS
MIX
GND
RBY
RBX
GX
GY
VCC1
R GAIN
X2
Y2
Y3
X3
VCC4
X1
Y1
IRS DET
AGC DET
AGC CONT
MAX GAIN
B GAIN
RB DET
B CONT
R CONT
G CONT
PED
REC mode

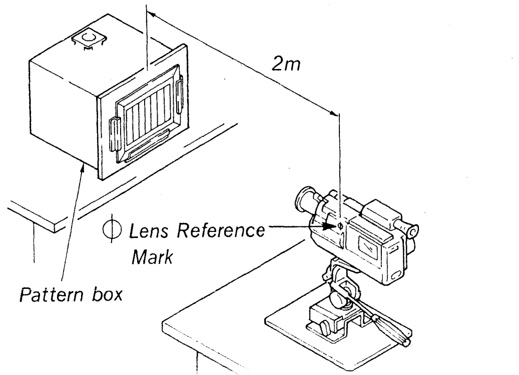
- **Signal path**

⇨ : REC Y/CHROMA Signal

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- ——— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

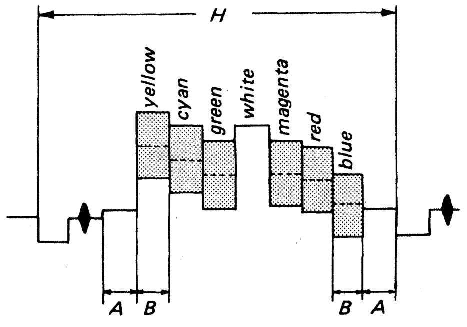


Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

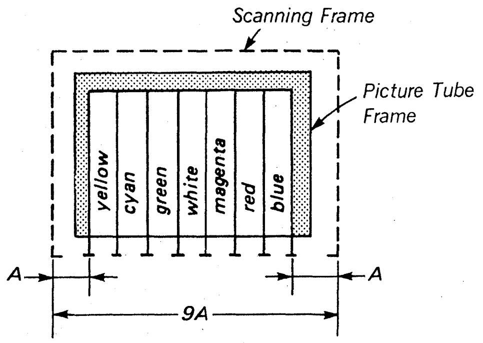
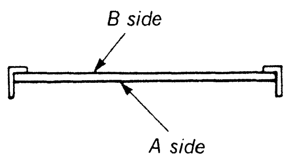

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

MX-2(CAMERA MATRIX)PRINTED WIRING BOARD

Note:

- ○ : indicates a lead wire mounted on the component side.
- ● : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▩ : Pattern from the side which enables seeing.
- ░ Pattern of the rear side.
- ▒ : B+ pattern from the side which enables seeing.
- ▨ : Printed resistor.


B side
A side

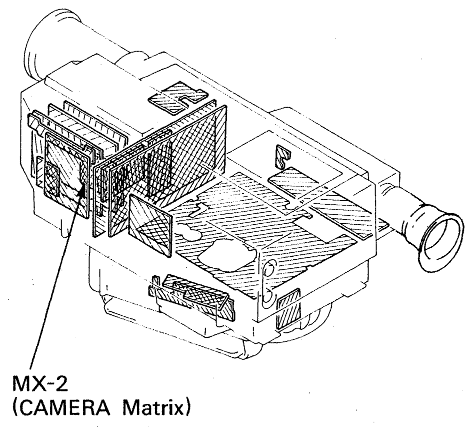
Note

Soldering side (SIDE A) : Parts on the soldering side being seen from the soldering are stated.

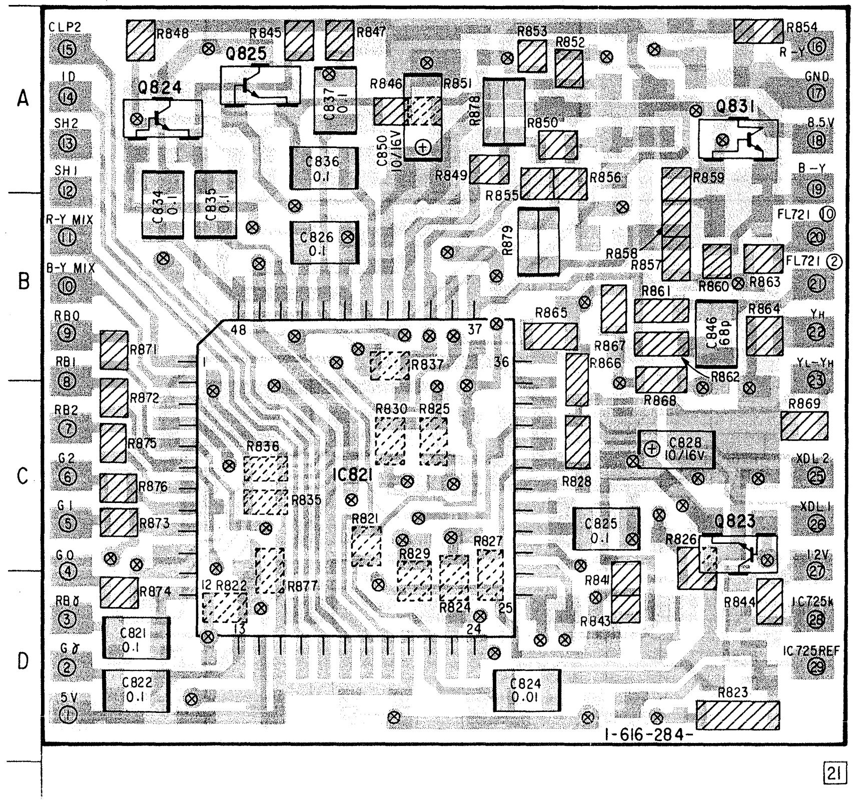
Component side (SIDE B) : Parts on the component side being seen from the component are stated.

Regarding color indication of patterns

- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.

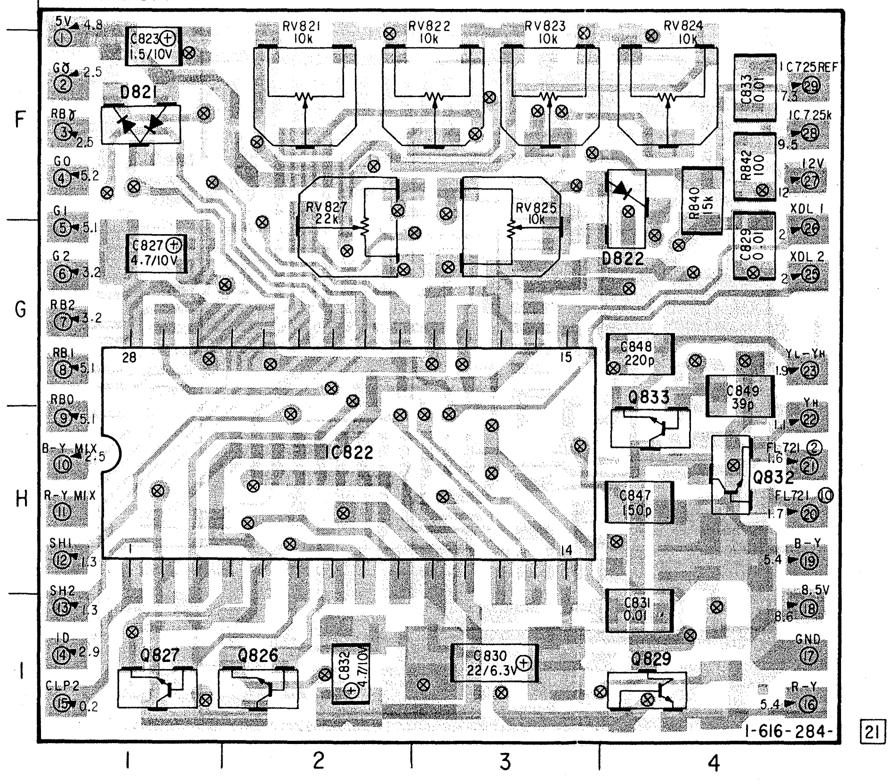

MX-2
(CAMERA Matrix)

MX-2 BOARD (A SIDE)

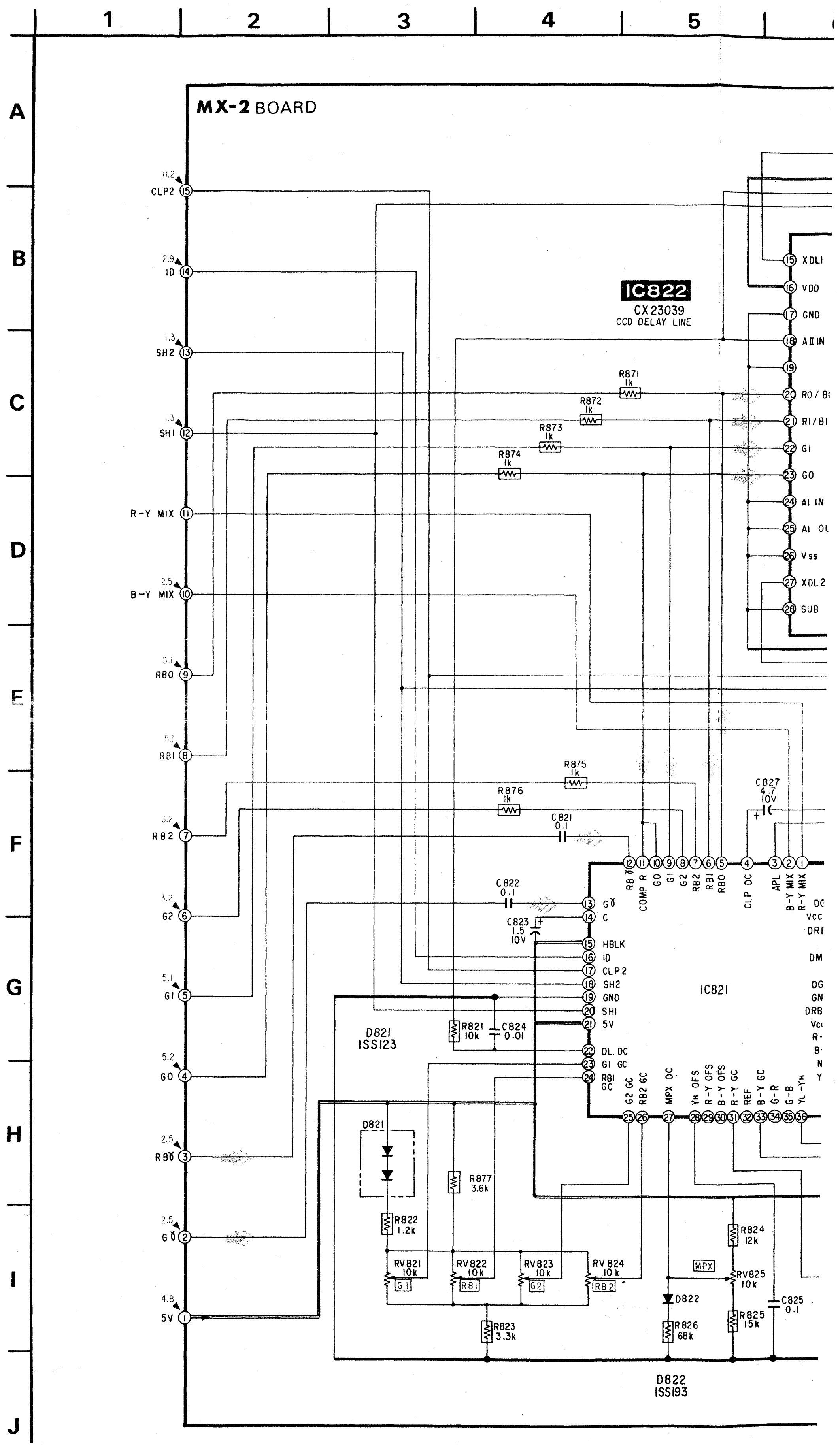

A
B
C
D
CLP2 ⑮
ID ⑭
SH2 ⑬
SH1 ⑫
R-Y MIX ⑪
B-Y MIX ⑩
RB0 ⑨
RB1 ⑧
RB2 ⑦
G2 ⑥
G1 ⑤
G0 ④
RBØ ③
GØ ②
5V ①
Q824
Q825
Q831
Q823
IC821
R-Y ⑯
GND ⑰
8.5V ⑱
B-Y ⑲
FL721 ⑩
FL721 ②
YH ㉒
YL-YH ㉓
XDL2 ㉕
XDL1 ㉖
12V ㉗
IC725k ㉘
IC725REF ㉙
C836 0.1
C837 0.1
C834 0.1
C835 0.1
C826 0.1
C850 10/16V
C828 10/16V
C846 68p
C825 0.1
C821 0.1
C822 0.1
C824 0.01
1-616-284-
21

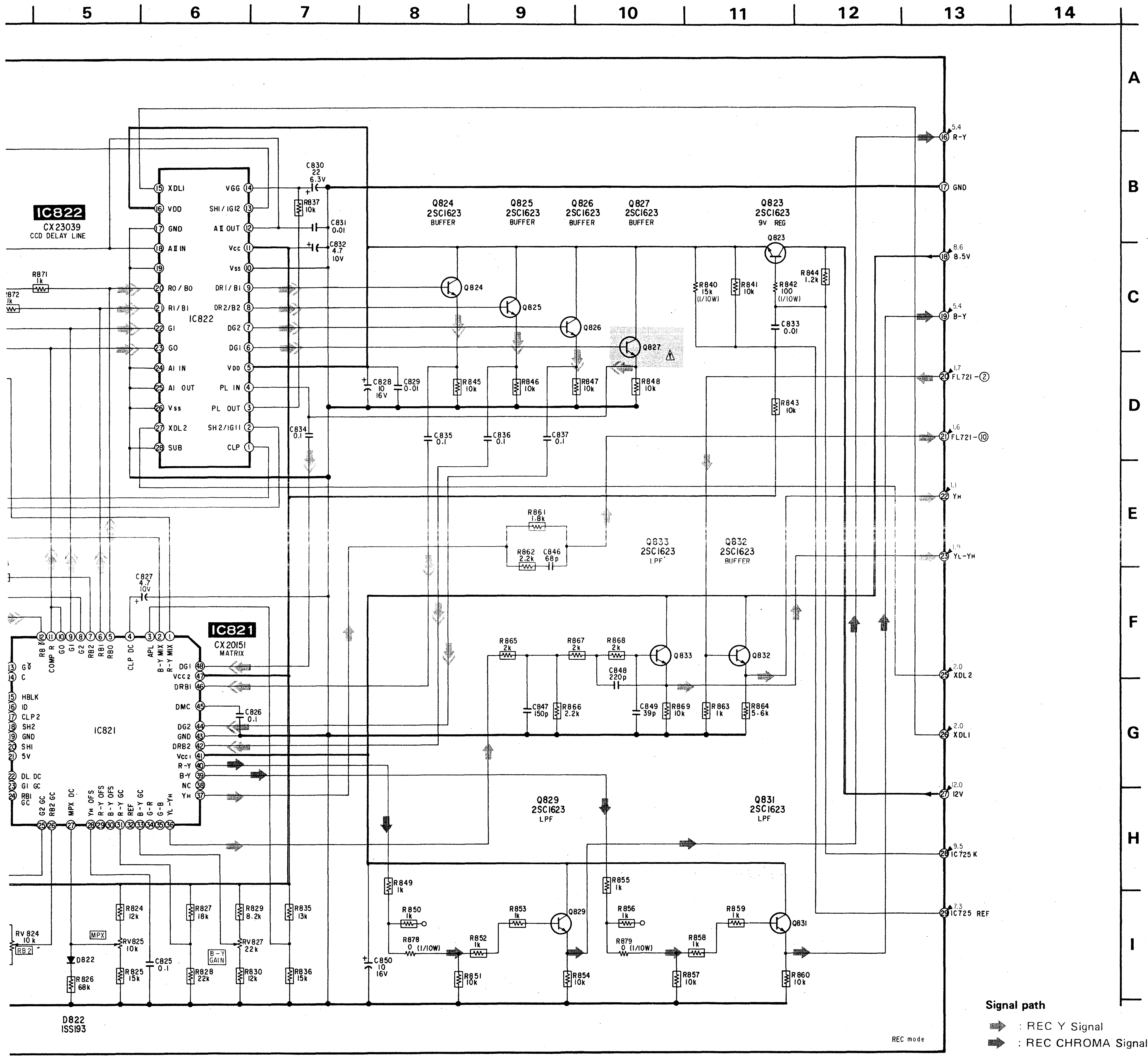
MX-2 BOARD (B SIDE)

REC mode


F
G
H
I
1
2
3
4
5V 4.8 ①
GØ 2.5 ②
RBØ 2.5 ③
G0 5.2 ④
G1 5.1 ⑤
G2 3.2 ⑥
RB2 3.2 ⑦
RB1 5.1 ⑧
RB0 5.1 ⑨
B-Y MIX 2.5 ⑩
R-Y MIX ⑪
SH1 1.3 ⑫
SH2 1.3 ⑬
ID 2.9 ⑭
CLP2 0.2 ⑮
RV821 10k
RV822 10k
RV823 10k
RV824 10k
RV827 22k
RV825 10k
C823 1.5/10V
C827 4.7/10V
D821
D822
IC822
Q833
Q832
Q827
Q826
Q829
C833 0.01
R842 100
R840 15k
C829 0.01
C848 220p
C849 39p
C847 150p
C831 0.01
C832 4.7/10V
C830 22/6.3V
IC725REF ㉙
IC725k ㉘
12V ㉗
XDL1 ㉖
XDL2 ㉕
YL-YH ㉓
YH ㉒
FL721 ②
FL721 ⑩
B-Y ⑲
8.5V ⑱
GND ⑰
R-Y ⑯
1-616-284-
21

MX-2(CAMERA MATRIX)SCHEMATIC DIAGRAM


1
2
3
4
5
A
B
C
D
E
F
G
H
I
J
MX-2 BOARD
IC822
CX23039
CCD DELAY LINE
IC821
CLP2 ⑮
ID ⑭
SH2 ⑬
SH1 ⑫
R-Y MIX ⑪
B-Y MIX ⑩
RB0 ⑨
RB1 ⑧
RB2 ⑦
G2 ⑥
G1 ⑤
G0 ④
RBØ ③
GØ ②
5V ①
XDL1
VDD
GND
AⅡ IN
RO/B
R1/B
G1
G0
A1 IN
VSS
XDL2
SUB
R871 1k
R872 1k
R873 1k
R874 1k
R875 1k
R876 1k
C821 0.1
C822 0.1
C823 1.5 10V
C827 4.7 10V
R821 10k
C824 0.01
D821 1SS123
R877 3.6k
R822 1.2k
RV821 10k
RV822 10k
RV823 10k
RV824 10k
R823 3.3k
R824 12k
RV825 10k
D822
R826 68k
R825 15k
C825 0.1
D822 1SS193
MPX
HBLK
ID
CLP2
SH2
GND
SH1
5V
DL DC
G1 GC
RB1 GC
G2 GC
RB2 GC
MPX DC
YH OFS
R-Y OFS
B-Y OFS
REF
B-Y GC
G-B
YL-YH
CLP DC
APL
B-Y MIX
R-Y MIX
COMP R
RB Ø
G0
G1
G2
RB1
RB0


5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
IC822
CX23039
CCD DELAY LINE
XDLI
VDD
GND
AII IN
RO / BO
RI / BI
GI
GO
AI IN
AI OUT
Vss
XDL2
SUB
VGG
SHI / IGI2
AII OUT
Vcc
Vss
DRI / BI
DR2 / B2
DG2
DGI
VDD
PL IN
PL OUT
SH2 / IGII
CLP
C830 22 6.3V
R837 10k
C831 0.01
C832 4.7 10V
C834 0.1
R871 1k
R872 1k
Q824 2SC1623 BUFFER
Q825 2SC1623 BUFFER
Q826 2SC1623 BUFFER
Q827 2SC1623 BUFFER
Q823 2SC1623 9V REG
R840 15k (1/10W)
R841 10k
R842 100 (1/10W)
R844 1.2k
C833 0.01
R843 10k
C828 10 16V
C829 0.01
R845 10k
R846 10k
R847 10k
R848 10k
C835 0.1
C836 0.1
C837 0.1
R861 1.8k
R862 2.2k
C846 68p
Q833 2SC1623 LPF
Q832 2SC1623 BUFFER
C827 4.7 10V
IC821
CX20151
MATRIX
IC821
R865 2k
R867 2k
R868 2k
C848 220p
C847 150p
R866 2.2k
C849 39p
R869 10k
R863 1k
R864 5.6k
C826 0.1
Q829 2SC1623 LPF
Q831 2SC1623 LPF
R849 1k
R850 1k
R878 0 (1/10W)
R852 1k
R853 1k
R851 10k
R854 10k
R855 1k
R856 1k
R879 0 (1/10W)
R858 1k
R857 10k
R859 1k
R860 10k
C850 10 16V
R824 12k
R825 15k
R826 68k
RV824 10k
RB2
MPX
RV825 10k
D822
C825 0.1
R827 18k
R828 22k
R829 8.2k
RV827 22k
B-Y GAIN
R830 12k
R835 13k
R836 15k
D822 ISS193
5.4 ⑯ R-Y
⑰ GND
8.6 ⑱ 8.5V
5.4 ⑲ B-Y
1.7 ⑳ FL721-②
1.6 ㉑ FL721-⑩
1.1 ㉒ YH
㉓ YL-YH
2.0 ㉕ XDL2
2.0 ㉖ XDLI
12.0 ㉗ 12V
9.5 ㉘ IC725 K
7.3 ㉙ IC725 REF
REC mode

Signal path

➡ : REC Y Signal

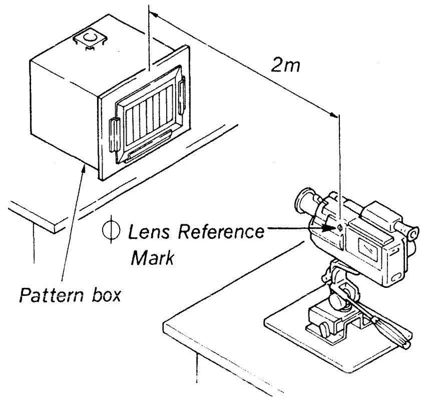
➡ : REC CHROMA Signal

⇨ : REC Y/CHROMA Signal

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

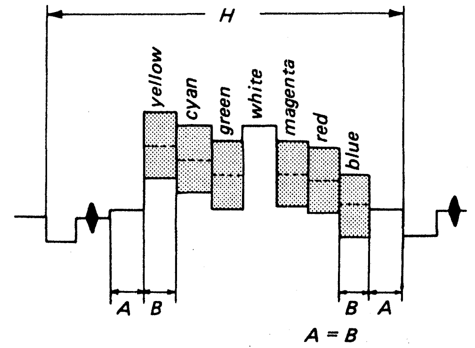

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

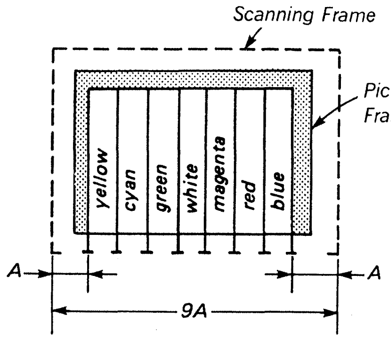

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

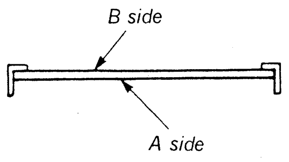
Fig. b Picture of TV monitor screen

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note:

- ○— : indicates a lead wire mounted on the component side.
- ●- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▩ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side.
- ▒ : B+ pattern from the side which enables seeing.
- ▨ : Printed resistor.



B side
A side

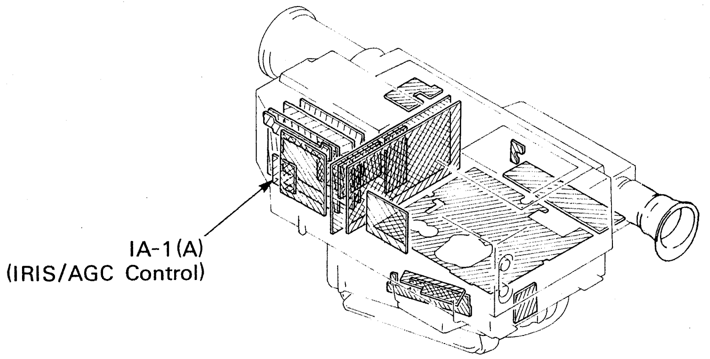
Note

Soldering side : Parts on the soldering side being
(SIDE A) seen from the soldering are stated.

Component side : Parts on the component side being
(SIDE B) seen from the component are stated.

Regarding color indication of patterns

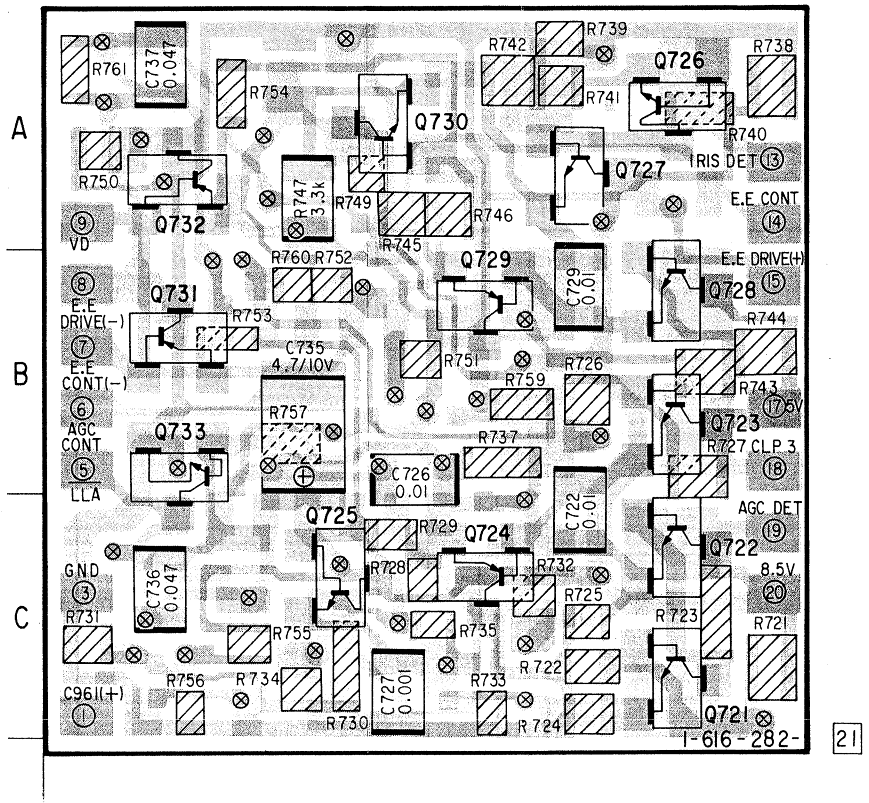
- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.



IA-1(A)
(IRIS/AGC Control)

IA-1(IRIS/AGC CONTROL) PRINTED WIRING BOARD

IA-1 BOARD (A SIDE)

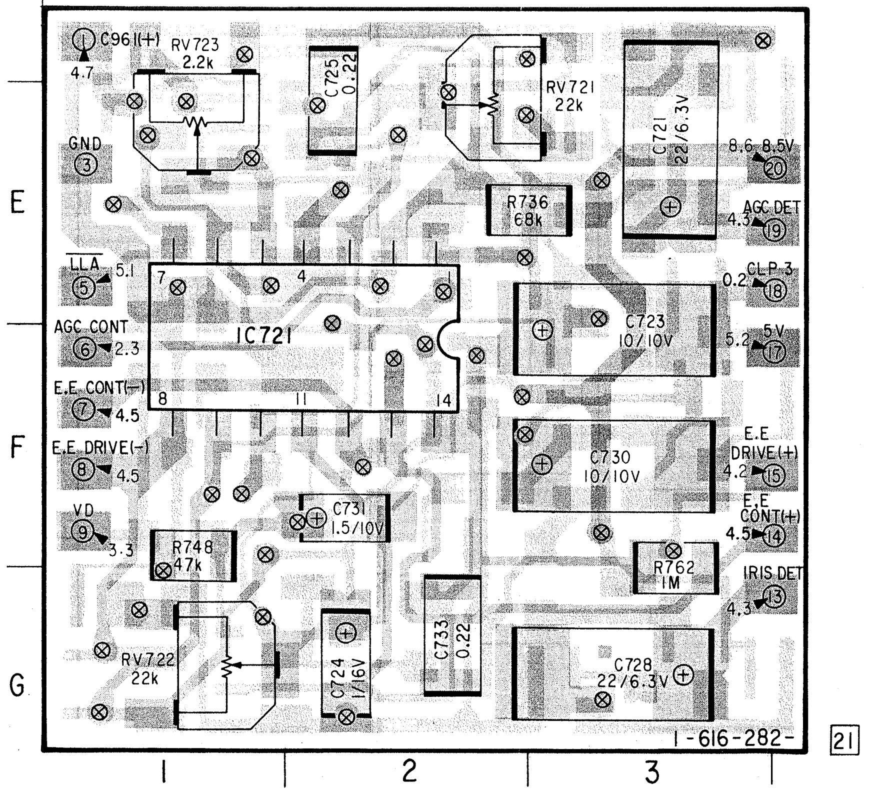


A
B
C
R761
C737 0.047
R754
R742
R739
Q726
R738
R741
Q730
R740
IRIS DET ⑬
R750
Q727
E.E CONT ⑭
Q732
R747 3.3k
R749
R746
⑨ VD
R745
R760 R752
Q729
E.E DRIVE(+) ⑮
C729 0.01
Q728
⑧ E.E DRIVE(−)
Q731
R753
R744
⑦ E.E CONT(−)
C735 4.7/10V
R751
R759
R726
R743
⑰ 5V
⑥ AGC CONT
R757
Q733
R737
Q723
R727 CLP 3 ⑱
⑤ LLA
C726 0.01
C722 0.01
AGC DET ⑲
Q725
R729
Q724
Q722
GND ③
C736 0.047
R728
R732
8.5V ⑳
R731
R725
R723
R755
R735
R721
C961(+) ①
R756
R734
C727 0.001
R733
R722
R730
R724
Q721
1-616-282-
21

D

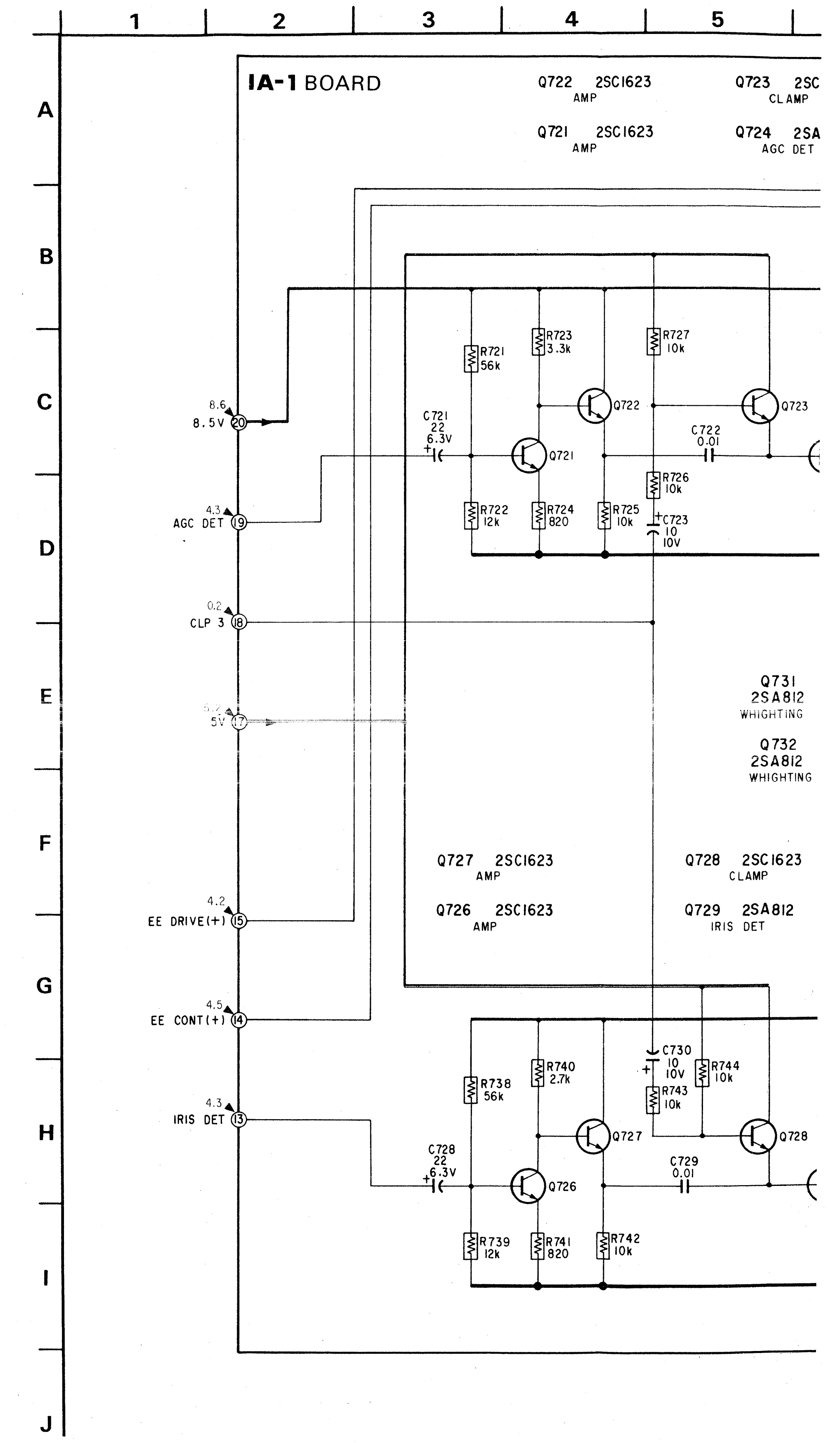
IA-1 BOARD (B SIDE)

REC mode

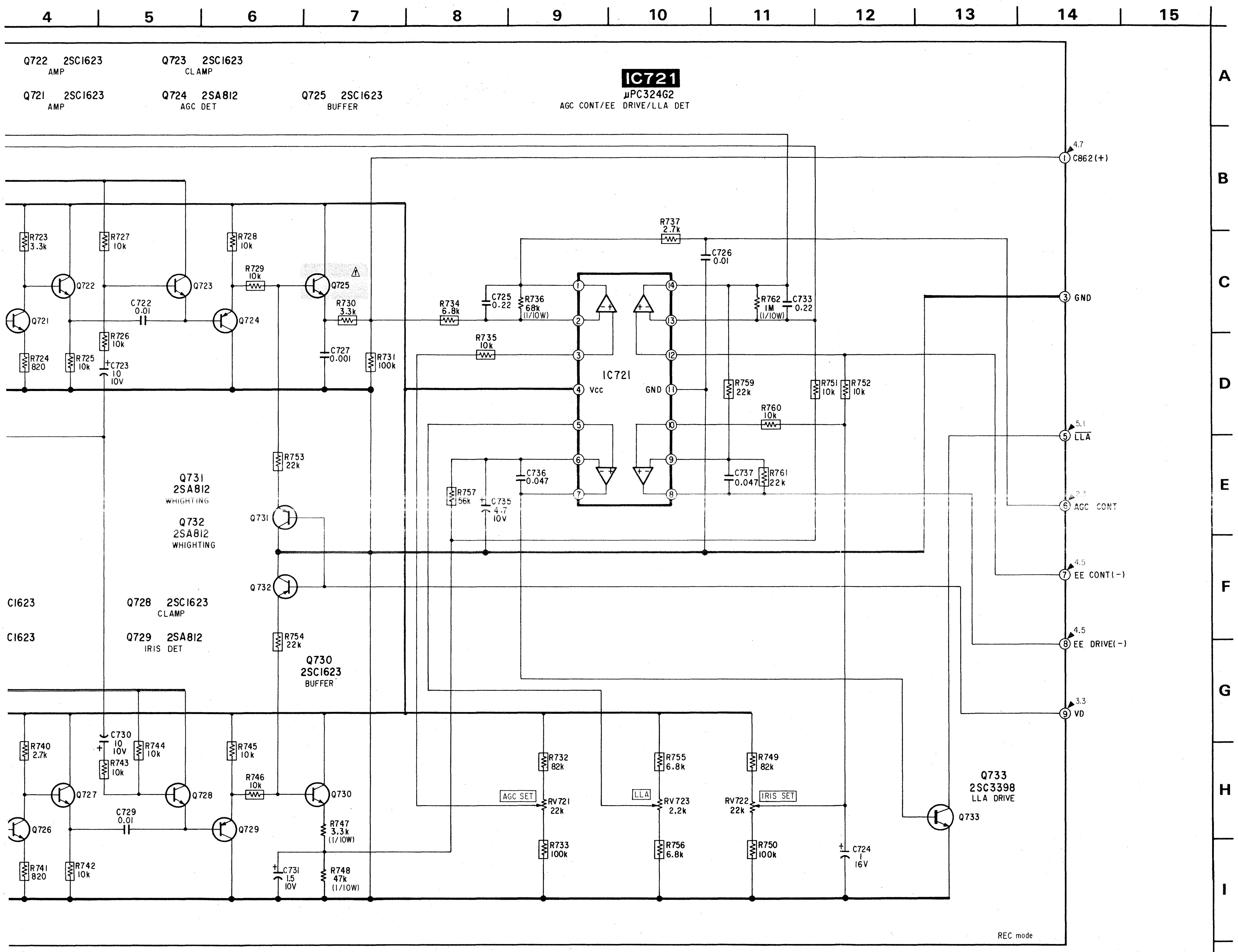


E
F
G
① C961(+) 4.7
RV723 2.2k
C725 0.22
RV721 22k
C721 22/6.3V
GND ③
8.6 8.5V ⑳
R736 68k
AGC DET 4.3 ⑲
LLA ⑤ 5.1
7
4
CLP 3 0.2 ⑱
IC721
C723 10/10V
5V 5.2 ⑰
AGC CONT ⑥ 2.3
E.E CONT(−) ⑦ 4.5
8
11
14
E.E DRIVE(−) ⑧ 4.5
C730 10/10V
E.E DRIVE(+) 4.2 ⑮
E.E CONT(+) 4.5 ⑭
VD ⑨ 3.3
C731 1.5/10V
R748 47k
R762 1M
IRIS DET 4.3 ⑬
RV722 22k
C724 1/16V
C733 0.22
C728 22/6.3V
1-616-282-
21
1
2
3

IA-1(IRIS/AGC CONTROL) SCHEMATIC DIAGRAM



1
2
3
4
5
A
B
C
D
E
F
G
H
I
J
IA-1 BOARD
Q722 2SC1623 AMP
Q723 2SC CLAMP
Q721 2SC1623 AMP
Q724 2SA AGC DET
R721 56k
R723 3.3k
R727 10k
8.6 8.5V ⑳
C721 22 6.3V
Q722
Q723
C722 0.01
Q721
R726 10k
4.3 AGC DET ⑲
R722 12k
R724 820
R725 10k
C723 10 10V
0.2 CLP 3 ⑱
Q731 2SA812 WHIGHTING
5V ⑰
Q732 2SA812 WHIGHTING
Q727 2SC1623 AMP
Q728 2SC1623 CLAMP
4.2 EE DRIVE(+) ⑮
Q726 2SC1623 AMP
Q729 2SA812 IRIS DET
4.5 EE CONT(+) ⑭
C730 10 10V
R740 2.7k
R744 10k
R738 56k
R743 10k
4.3 IRIS DET ⑬
Q727
Q728
C728 22 6.3V
C729 0.01
Q726
R739 12k
R741 820
R742 10k


4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
Q722 2SC1623 AMP
Q723 2SC1623 CLAMP
Q721 2SC1623 AMP
Q724 2SA812 AGC DET
Q725 2SC1623 BUFFER
IC721
µPC324G2
AGC CONT/EE DRIVE/LLA DET
R723 3.3k
R727 10k
R728 10k
R729 10k
R730 3.3k
R724 820
R725 10k
R726 10k
C722 0.01
C723 10 10V
C727 0.001
R731 100k
R734 6.8k
R735 10k
C725 0.22
R736 68k (1/10W)
R737 2.7k
C726 0.01
R762 1M (1/10W)
C733 0.22
IC721
Vcc
GND
R759 22k
R760 10k
R751 10k
R752 10k
R757 56k
C735 4.7 10V
C736 0.047
C737 0.047
R761 22k
R753 22k
R754 22k
Q731 2SA812 WHIGHTING
Q732 2SA812 WHIGHTING
Q731
Q732
C1623
C1623
Q728 2SC1623 CLAMP
Q729 2SA812 IRIS DET
Q730 2SC1623 BUFFER
R740 2.7k
C730 10 10V
R744 10k
R743 10k
R745 10k
R746 10k
C729 0.01
R741 820
R742 10k
R747 3.3k (1/10W)
C731 1.5 10V
R748 47k (1/10W)
R732 82k
AGC SET
RV721 22k
R733 100k
R755 6.8k
LLA
RV723 2.2k
R756 6.8k
R749 82k
RV722 22k
IRIS SET
R750 100k
C724 1 16V
Q733 2SC3398 LLA DRIVE
Q733
① C862(+) 4.7
③ GND
⑤ LLA 5.1
⑥ AGC CONT
⑦ EE CONT(-) 4.5
⑧ EE DRIVE(-) 4.5
⑨ VD 3.3
REC mode

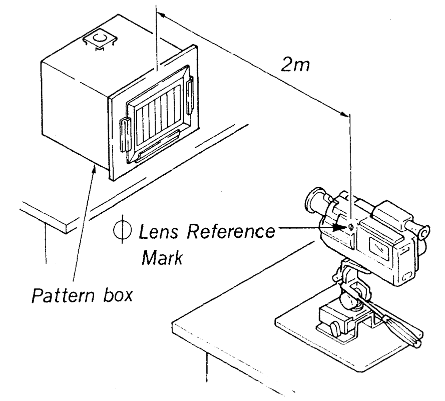
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- ——— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

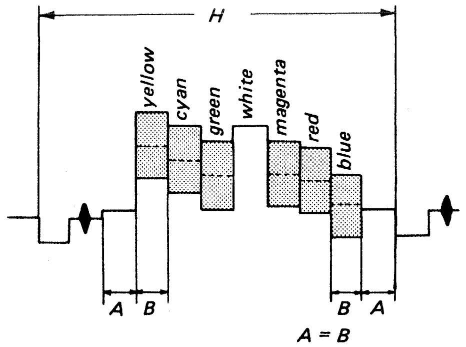

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

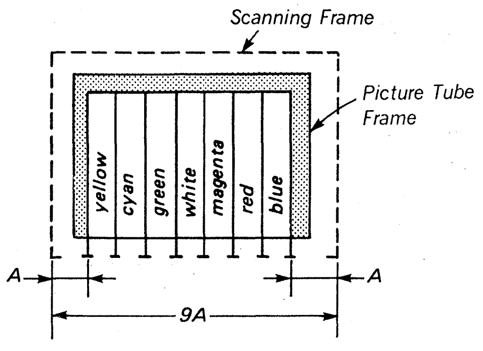
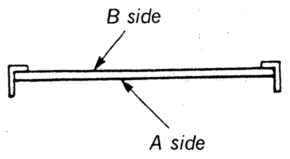

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

RP-34(REC/PB AMP)PRINTED WIRING BOARD

Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▒ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side.
- ▒ : B+ pattern from the side which enables seeing.
- ▨ : Printed resistor.



B side
A side

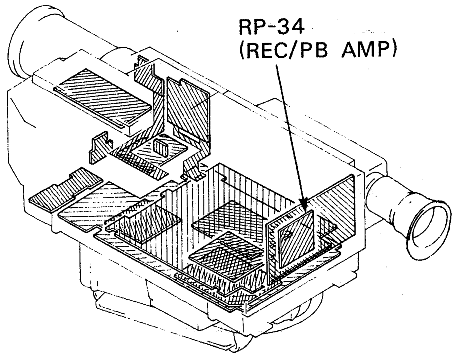
Note

Soldering side (SIDE A) : Parts on the soldering side being seen from the soldering are stated.

Component side (SIDE B) : Parts on the component side being seen from the component are stated.

Regarding color indication of patterns

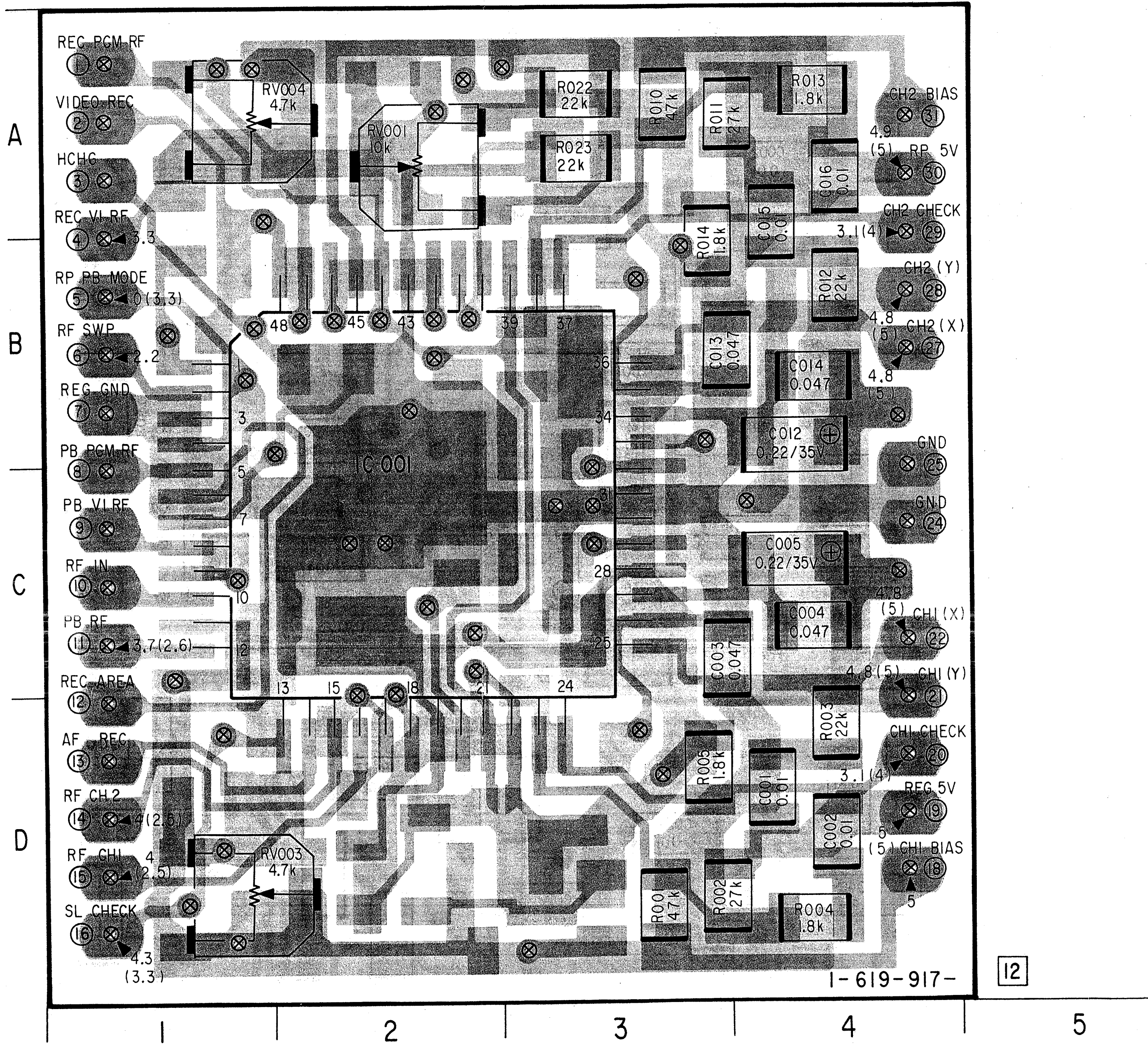
- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.



RP-34
(REC/PB AMP)

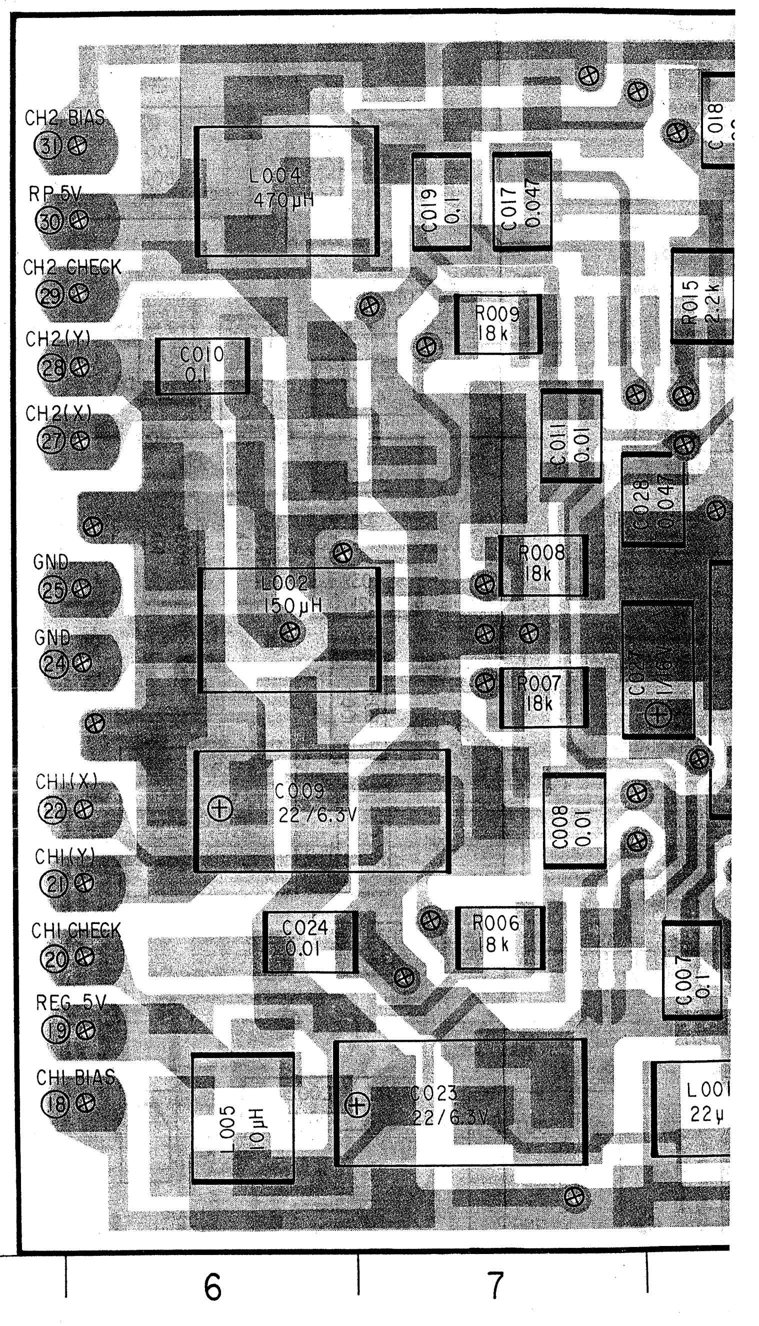
no mark : RECmode
( ) : PB mode

RP-34 BOARD (B SIDE)



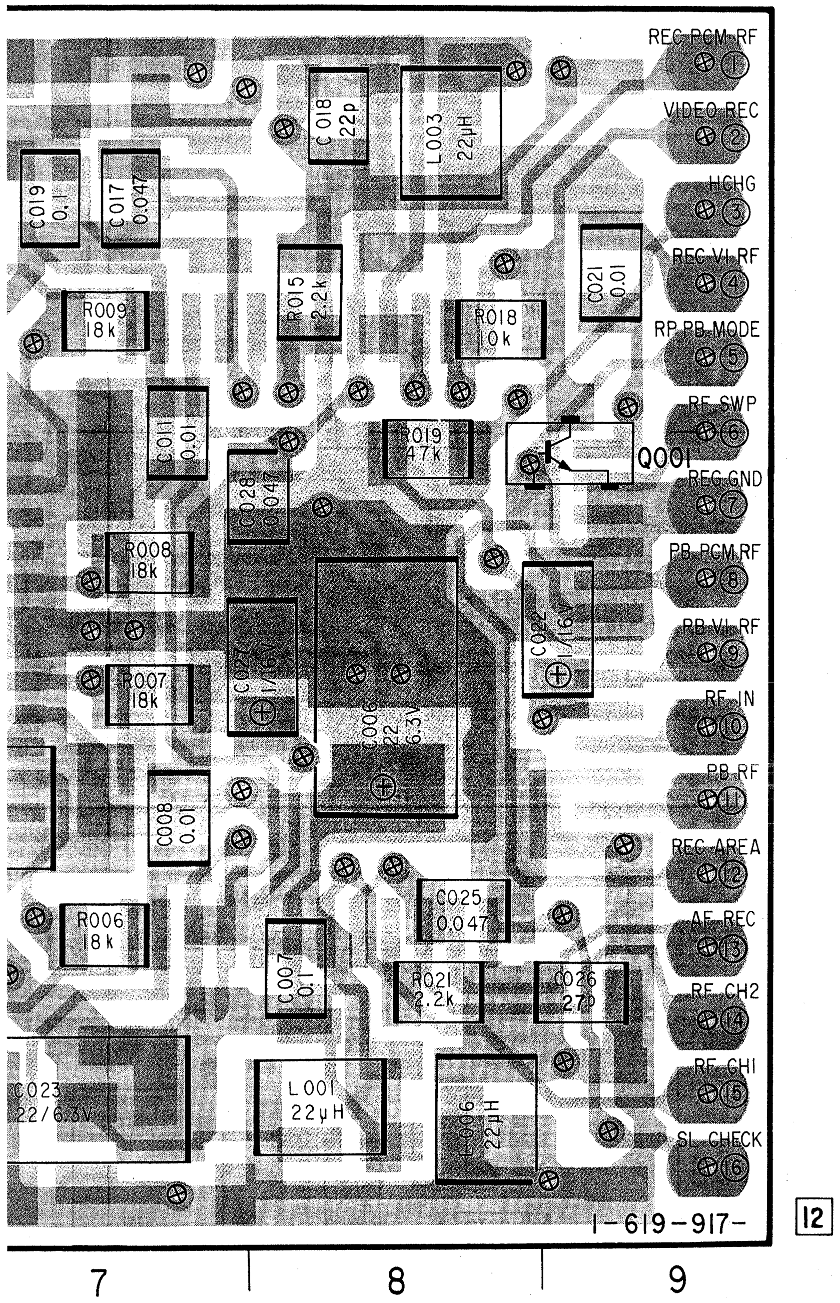
A
B
C
D
1
2
3
4
5
REC PCM RF ①
VIDEO REC ②
HCHG ③
REC VI RF ④ 3.3
RP PB MODE ⑤ 0(3.3)
RF SWP ⑥ 2.2
REC GND ⑦
PB PCM RF ⑧
PB VI RF ⑨
RF IN ⑩
PB RF ⑪ 3.7(2.6)
REC AREA ⑫
AF REC ⑬
RF CH2 ⑭ 4(2.5)
RF CHI ⑮ 4(2.5)
SL CHECK ⑯ 4.3(3.3)
RV004 4.7k
RV001 10k
RV003 4.7k
R022 22k
R023 22k
R010 47k
R011 27k
R013 1.8k
C016 0.01
C015 0.01
R014 1.8k
R012 22k
C013 0.047
C014 0.047
C012 0.22/35V
C005 0.22/35V
C004 0.047
C003 0.047
R003 22k
R005 1.8k
C001 0.01
C002 0.01
R001 47k
R002 27k
R004 1.8k
IC001
48 45 43 39 37 36 34 31 28 25 24 21 18 15 13 12 10 7 5 3
CH2 BIAS ㉛ 4.9(5)
RP 5V ㉚
CH2 CHECK ㉙ 3.1(4)
CH2(Y) ㉘ 4.8(5)
CH2(X) ㉗ 4.8(5)
GND ㉕
GND ㉔
CHI(X) ㉒ 4.8(5)
CHI(Y) ㉑ 4.8(5)
CHI CHECK ⑳ 3.1(4)
REG 5V ⑲
CHI BIAS ⑱ 5(5)
1-619-917-
12

RP-34 BOARD (A SIDE)

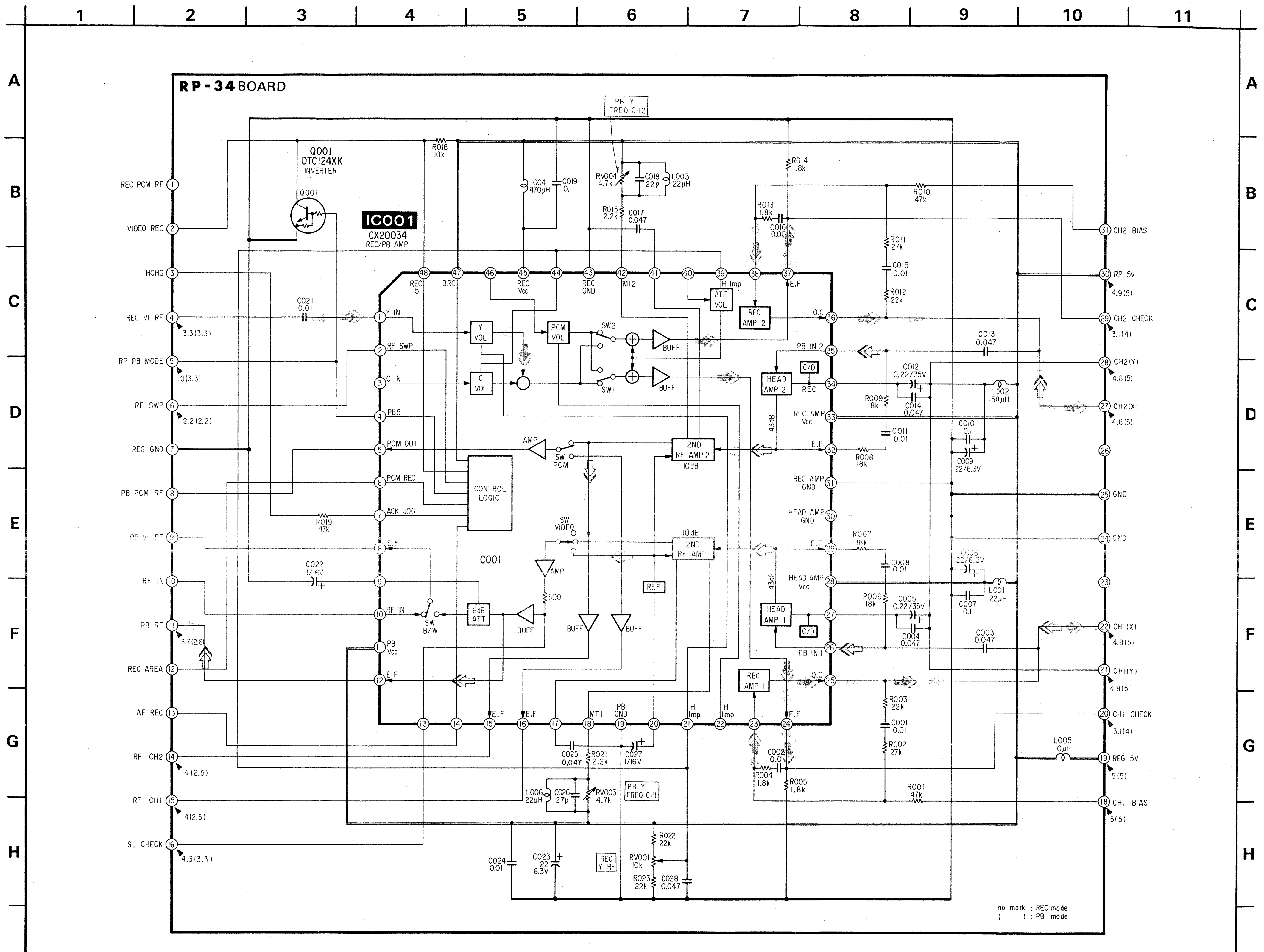


6
7
CH2 BIAS ㉛
RP 5V ㉚
CH2 CHECK ㉙
CH2(Y) ㉘
CH2(X) ㉗
GND ㉕
GND ㉔
CHI(X) ㉒
CHI(Y) ㉑
CHI CHECK ⑳
REG 5V ⑲
CHI BIAS ⑱
L004 470μH
C019 0.1
C017 0.047
C018
R009 18k
R015 2.2k
C010 0.1
C011 0.01
R008 18k
L002 150μH
R007 18k
C009 22/6.3V
C008 0.01
C024 0.01
R006 18k
C007 0.1
L005 10μH
C023 22/6.3V
L001 22μ

E)

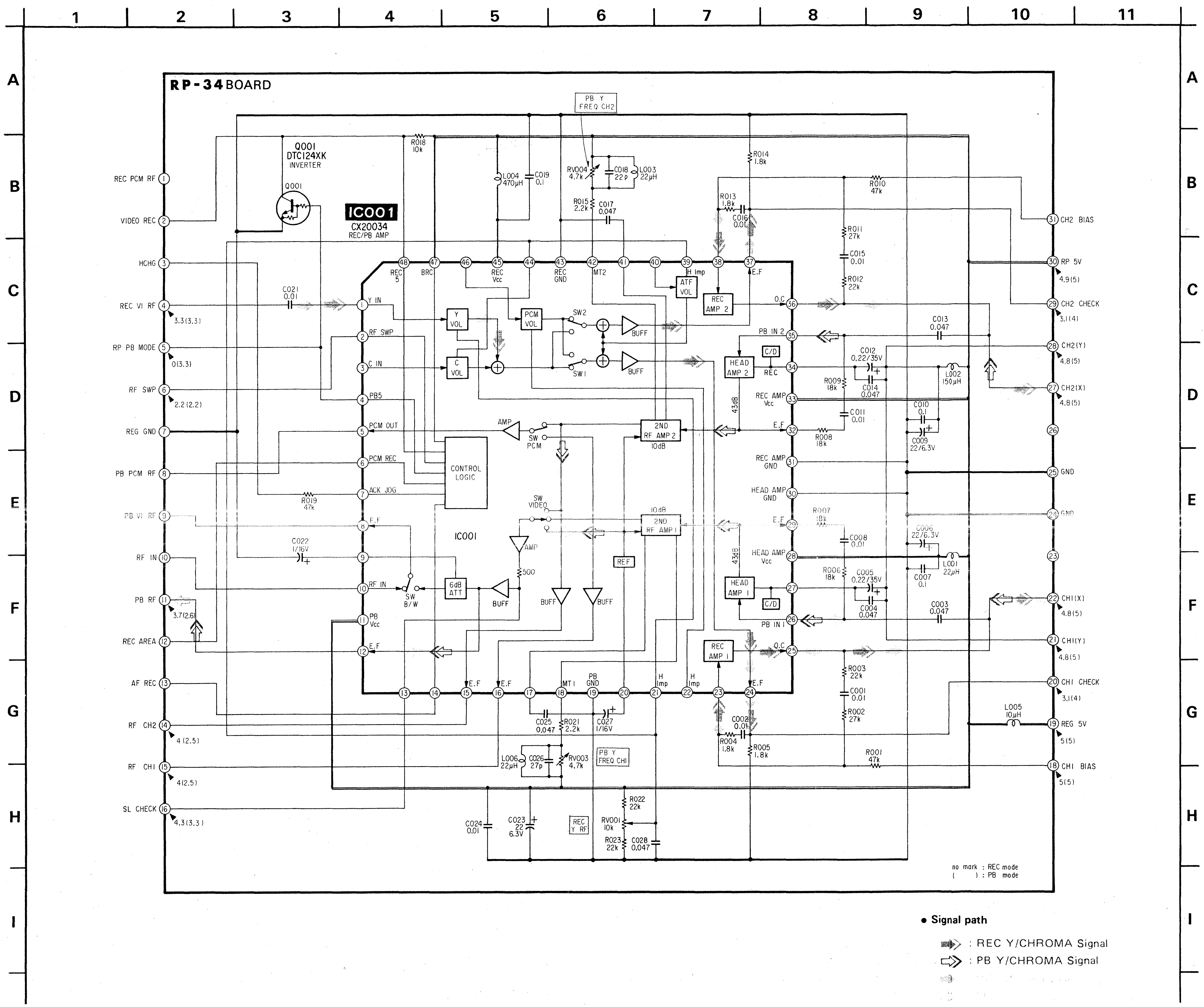

REC PCM RF
VIDEO REC
HCHG
REC VI RF
RP PB MODE
RF SWP
REG GND
PB PCM RF
PB VI RF
RF IN
PB RF
REC AREA
AF REC
RF CH2
RF CHI
SL CHECK
C019 0.1
C017 0.047
C018 22p
L003 22μH
R015 2.2k
R018 10k
C021 0.01
R009 18k
C011 0.01
C028 0.047
R019 47k
Q001
R008 18k
C022 1/16V
R007 18k
C027 1/16V
C006 22 6.3V
C008 0.01
C025 0.047
R006 18k
C007 0.1
R021 2.2k
C026 27p
C023 22/6.3V
L001 22μH
L006 22μH
1-619-917-
12
7
8
9

RP-34(REC/PB AMP) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
RP-34 BOARD
Q001 DTC124XK INVERTER
IC001 CX20034 REC/PB AMP
PB Y FREQ CH2
PB Y FREQ CHI
REC PCM RF
VIDEO REC
HCHG
REC VI RF
RP PB MODE
RF SWP
REG GND
PB PCM RF
PB VI RF
RF IN
PB RF
REC AREA
AF REC
RF CH2
RF CH1
SL CHECK
CH2 BIAS
RP 5V
CH2 CHECK
CH2(Y)
CH2(X)
GND
CH1(X)
CH1(Y)
CH1 CHECK
REG 5V
CH1 BIAS
3.3(3.3)
0(3.3)
2.2(2.2)
3.7(2.6)
4(2.5)
4.3(3.3)
4.9(5)
3.1(4)
4.8(5)
5(5)
Y IN
RF SWP
C IN
PB5
PCM OUT
PCM REC
ACK JOG
E.F
RF IN
PB Vcc
Y VOL
C VOL
PCM VOL
SW2
SW1
BUFF
AMP
SW PCM
CONTROL LOGIC
SW VIDEO
2ND RF AMP 2 10dB
2ND RF AMP 1 10dB
6dB ATT
SW B/W
REF
ATF VOL
REC AMP 2
REC AMP 1
HEAD AMP 2
HEAD AMP 1
C/D
REC
43dB
REC AMP Vcc
REC AMP GND
HEAD AMP GND
HEAD AMP Vcc
PB IN 2
PB IN 1
O.C
H Imp
MT1
MT2
PB GND
REC Vcc
REC GND
BRC
REC Y RF
R018 10k
R014 1.8k
R013 1.8k
R010 47k
R011 27k
R012 22k
R015 2.2k
RV004 4.7k
RV003 4.7k
RV001 10k
L004 470μH
L003 22μH
L002 150μH
L001 22μH
L005 10μH
L006 22μH
C019 0.1
C018 22p
C017 0.047
C016 0.01
C015 0.01
C021 0.01
C022 1/16V
C013 0.047
C012 0.22/35V
C014 0.047
C011 0.01
C010 0.1
C009 22/6.3V
C008 0.01
C006 22/6.3V
C007 0.1
C005 0.22/35V
C004 0.047
C003 0.047
C002 0.01
C001 0.01
C025 0.047
C026 27p
C027 1/16V
C024 0.01
C023 22 6.3V
C028 0.047
R019 47k
R009 18k
R008 18k
R007 18k
R006 18k
R003 22k
R002 27k
R001 47k
R004 1.8k
R005 1.8k
R021 2.2k
R022 22k
R023 22k
500
no mark : REC mode
( ) : PB mode

- **Signal path**
- ➡ : REC Y/CHROMA Signal
- ⇨ : PB Y/CHROMA Signal

RP-34(REC/PB AMP) SCHEMATIC DIAGRAM

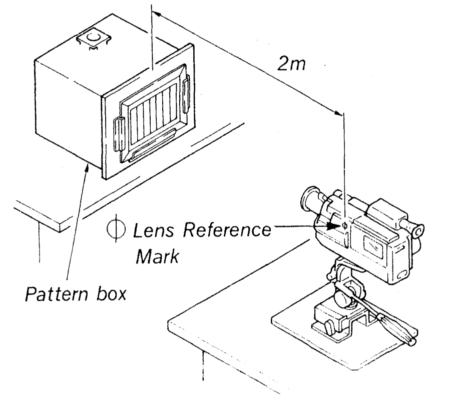

1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
RP-34 BOARD
IC001
CX20034
REC/PB AMP
Q001
DTC124XK
INVERTER
REC PCM RF ①
VIDEO REC ②
HCHG ③
REC VI RF ④
RP PB MODE ⑤
RF SWP ⑥
REG GND ⑦
PB PCM RF ⑧
PB VI RF ⑨
RF IN ⑩
PB RF ⑪
REC AREA ⑫
AF REC ⑬
RF CH2 ⑭
RF CH1 ⑮
SL CHECK ⑯
CH2 BIAS ㉛
RP 5V ㉚
CH2 CHECK ㉙
CH2(Y) ㉘
CH2(X) ㉗
GND ㉕
GND ㉔
CH1(X) ㉒
CH1(Y) ㉑
CH1 CHECK ⑳
REG 5V ⑲
CH1 BIAS ⑱
Y IN
RF SWP
C IN
PBS
PCM OUT
PCM REC
ACK JOG
E.F
RF IN
PB Vcc
Y VOL
C VOL
PCM VOL
SW2
SW1
BUFF
CONTROL LOGIC
AMP
SW PCM
SW VIDEO
2ND RF AMP 2
10dB
2ND RF AMP 1
REF
6dB ATT
SW B/W
HEAD AMP 2
HEAD AMP 1
REC AMP 2
REC AMP 1
ATF VOL
H Imp
C/D
REC
PB IN 2
PB IN 1
O.C
REC AMP Vcc
REC AMP GND
HEAD AMP GND
HEAD AMP Vcc
43dB
MT1
MT2
PB GND
REC Vcc
REC GND
PB Y FREQ CH2
PB Y FREQ CH1
REC Y RF
R018 10k
L004 470µH
C019 0.1
RV004 4.7k
C018 22p
L003 22µH
R015 2.2k
C017 0.047
R014 1.8k
R013 1.8k
C016 0.01
R010 47k
R011 27k
C015 0.01
R012 22k
C013 0.047
C012 0.22/35V
C014 0.047
R009 18k
L002 150µH
C011 0.01
C010 0.1
C009 22/6.3V
R008 18k
R007 18k
C008 0.01
C006 22/6.3V
L001 22µH
C007 0.1
R006 18k
C005 0.22/35V
C004 0.047
C003 0.047
R003 22k
C001 0.01
R002 27k
C002 0.01
R004 1.8k
R005 1.8k
R001 47k
L005 10µH
C021 0.01
R019 47k
C022 1/16V
C025 0.047
R021 2.2k
C027 1/16V
L006 22µH
C026 27p
RV003 4.7k
C024 0.01
C023 22 6.3V
R022 22k
RV001 10k
R023 22k
C028 0.047
3.3(3.3)
0(3.3)
2.2(2.2)
3.7(2.6)
4(2.5)
4(2.5)
4.3(3.3)
4.9(5)
3.1(4)
4.8(5)
4.8(5)
4.8(5)
4.8(5)
3.1(4)
5(5)
5(5)
500
no mark : REC mode
( ) : PB mode

- **Signal path**
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- -▨- : Nonflammable resistor
- ——— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
ϕ Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

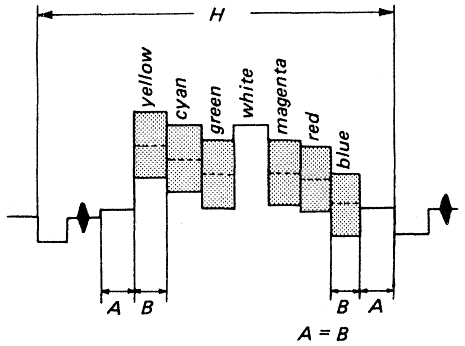

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

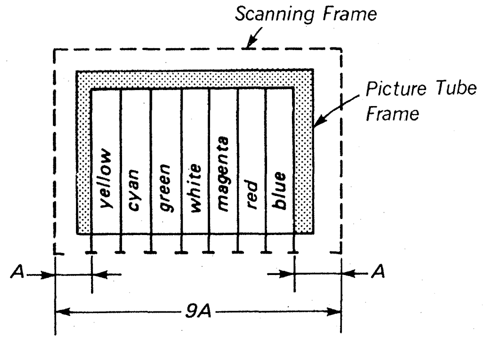
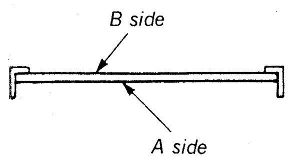

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.

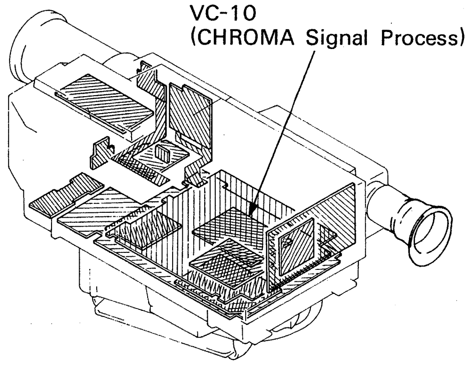

B side
A side

Note

Soldering side (SIDE A)	: Parts on the soldering side being seen from the soldering are stated.
Component side (SIDE B)	: Parts on the component side being seen from the component are stated.

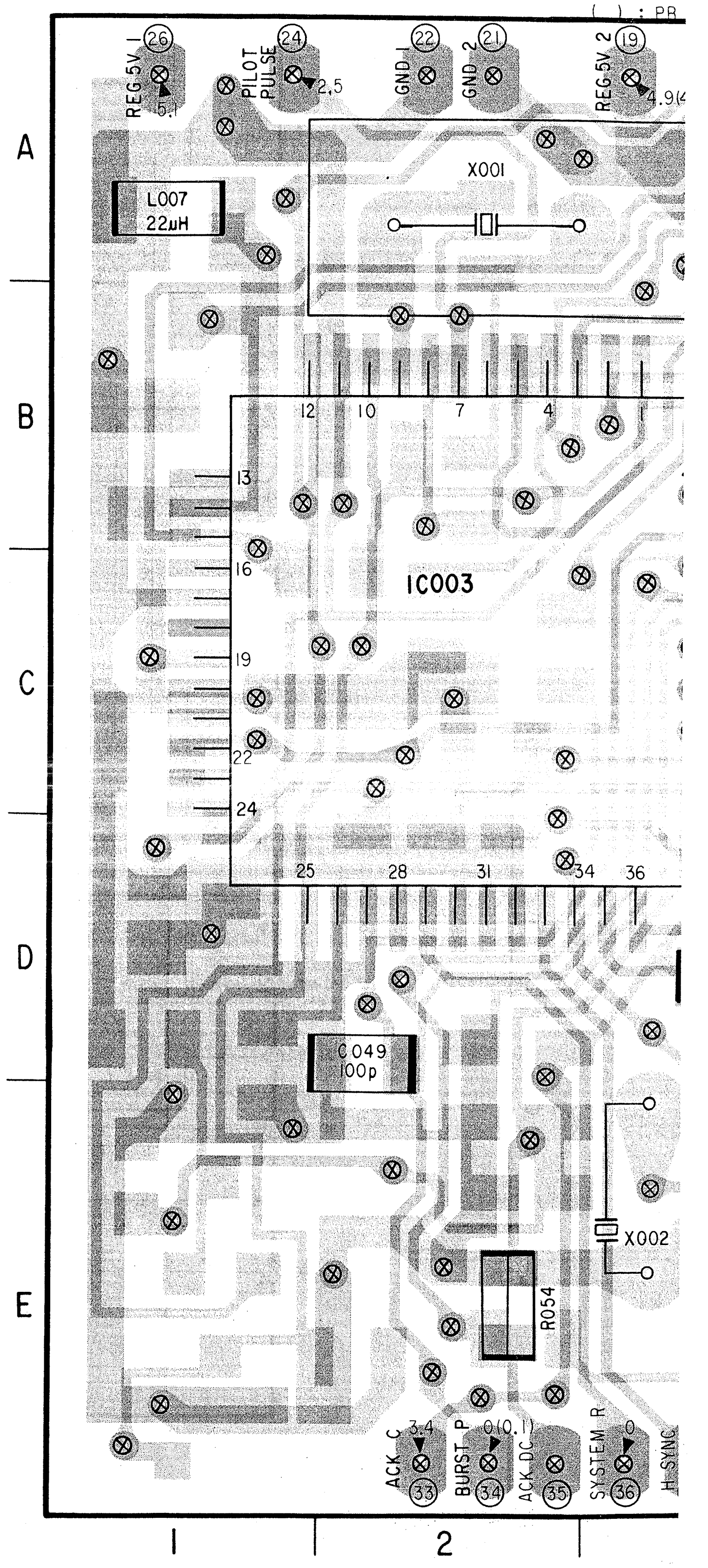
Regarding color indication of patterns

- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.


VC-10
(CHROMA Signal Process)

VC-10 BOARD (B SIDE)

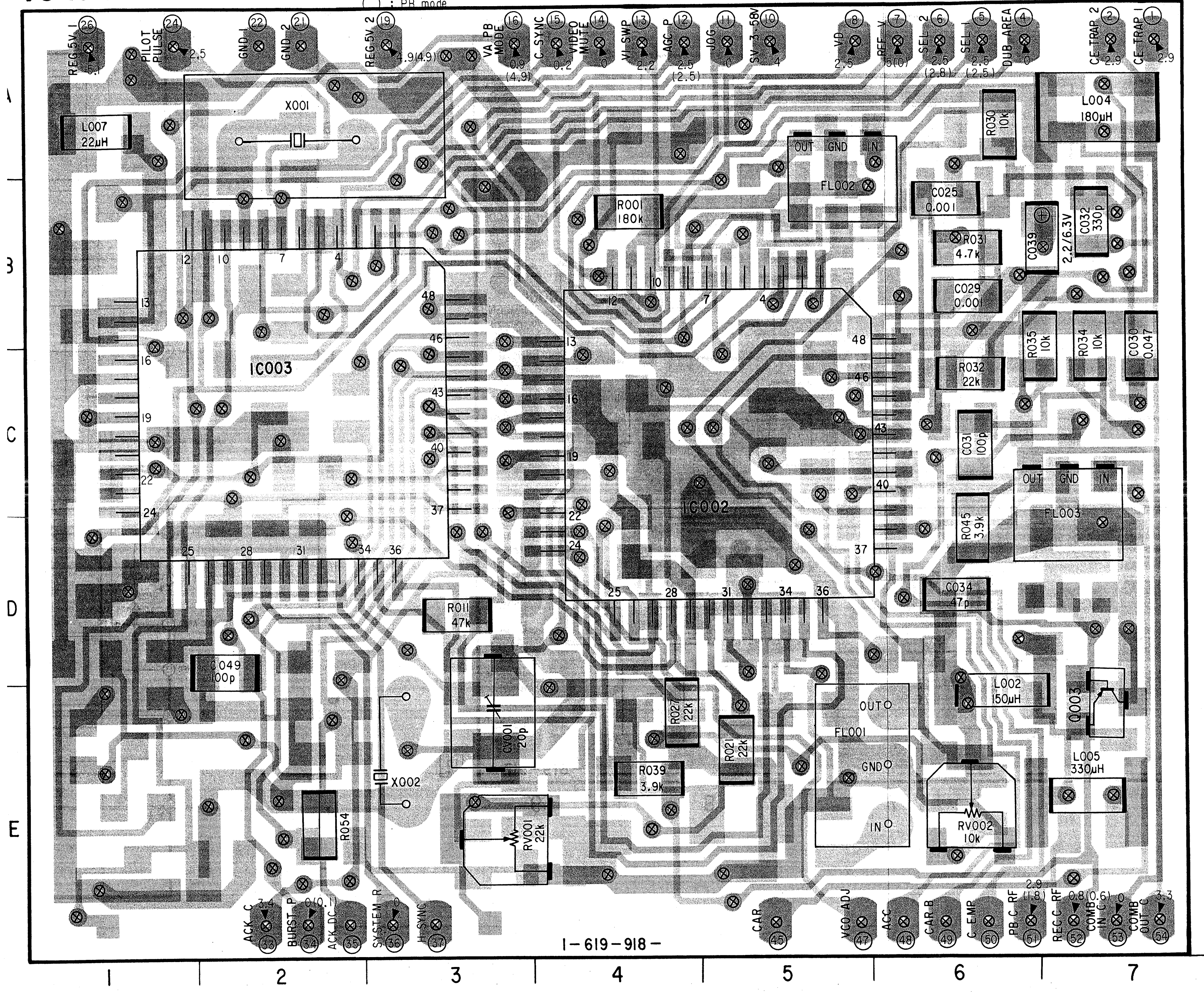
no mark : REC
( ) : PB


A
B
C
D
E
1
2
REG.5V 1
26
5.1
PILOT PULSE
24
2.5
GND 1
22
GND 2
21
REG.5V 2
19
4.9
L007
22μH
X001
IC003
12
10
7
4
13
16
19
22
24
25
28
31
34
36
C049
100p
X002
R054
ACK C
3.4
33
BURST P
0(0.1)
34
ACK DC
35
SYSTEM R
0
36
H-SYNC

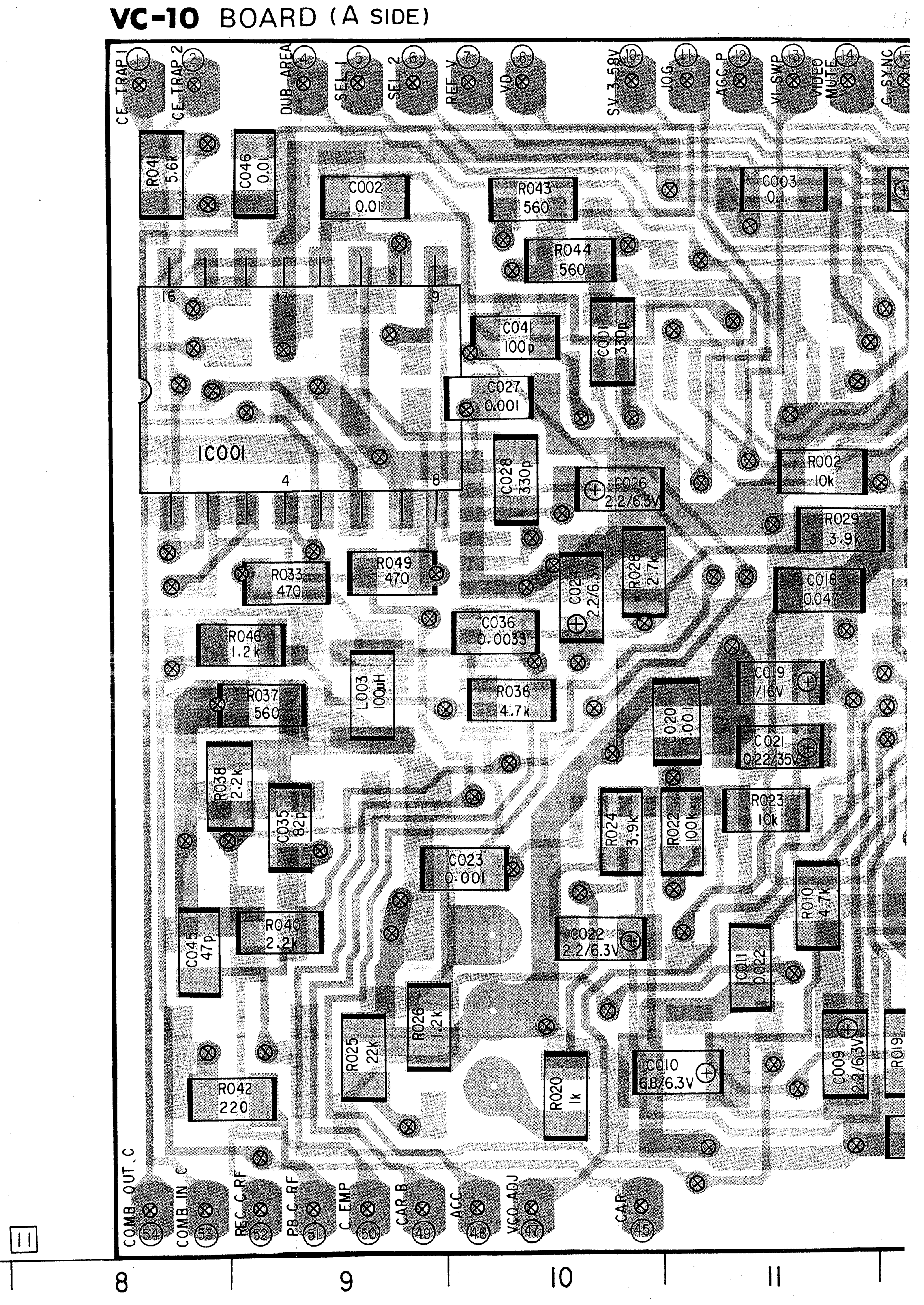
C-10(CHROMA SIGNAL PROCESS) PRINTED WIRING BOARD

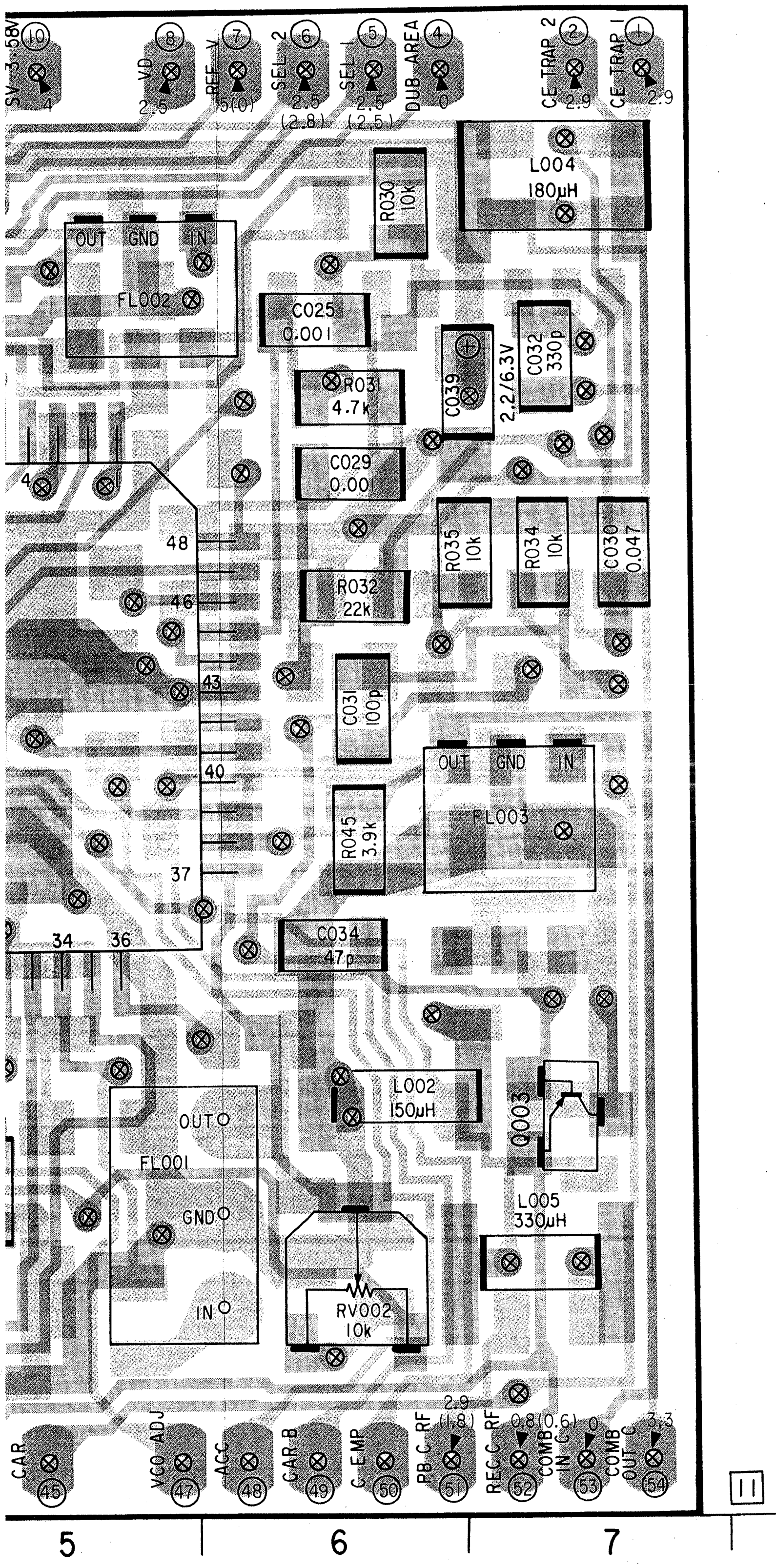
VC-10 BOARD (B SIDE)

no mark : REC mode
( ) : PB mode

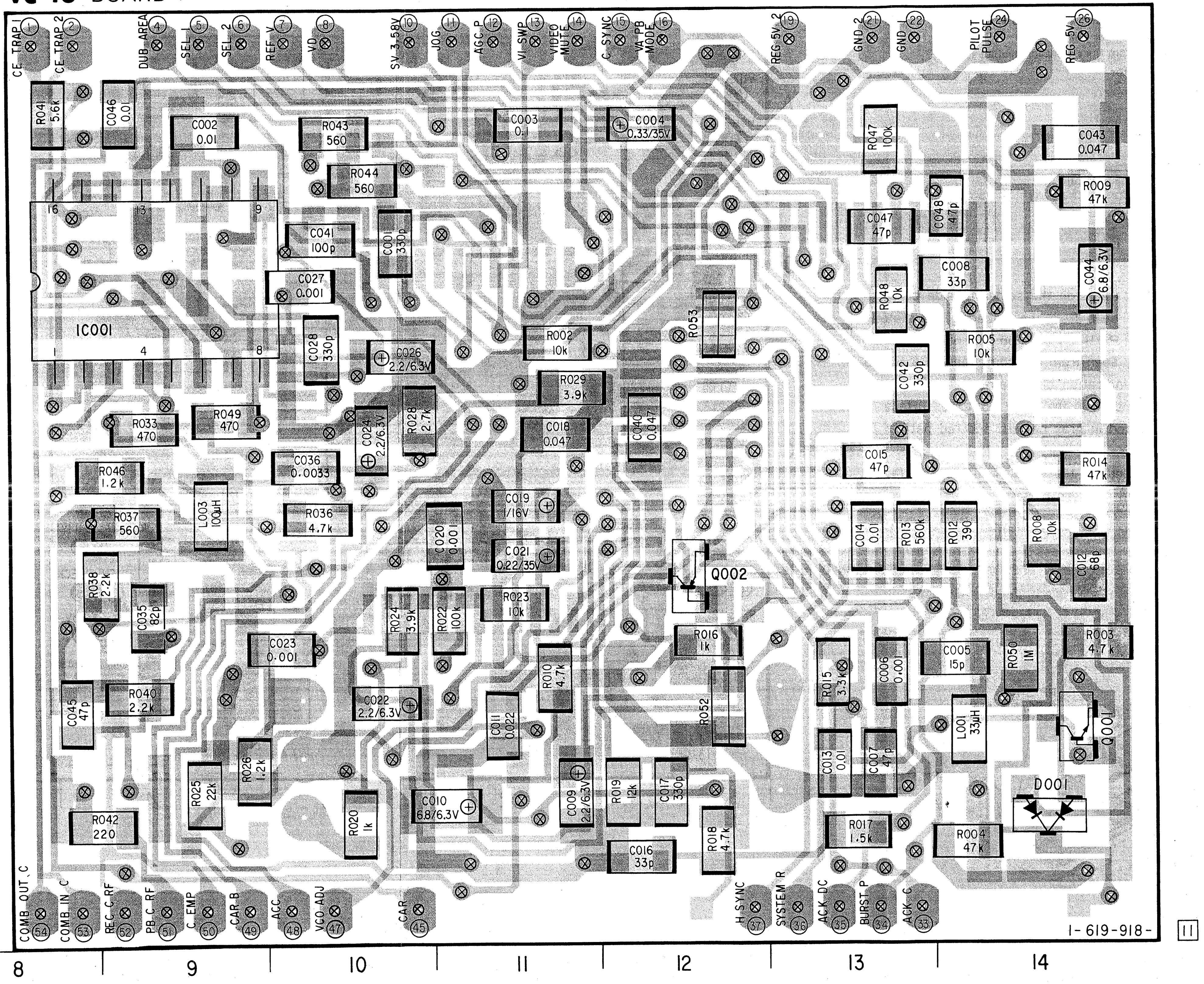

REG 5V 1 (26)
PILOT PULSE (24) 2.5
GND 1 (22)
GND 2 (21)
REG 5V 2 (19) 4.9(4.9)
VA PB MODE (16) 0.9 (4.9)
C SYNC (15) 0.2
VIDEO MUTE (14) 0
VI SWP (13) 2.2
AGC P (12) 2.5 (2.5)
JOG (11) 0
SV 3.58V (10) 4
VD (8) 2.5
REF V (7) 5(0)
SEL 2 (6) 2.5 (2.8)
SEL 1 (5) 2.8 (2.5)
DUB AREA (4) 0
CE TRAP 2 (2) 2.9
CE TRAP 1 (1) 2.9
A
B
C
D
E
L007 22µH
X001
OUT GND IN
FL002
R030 10k
L004 180µH
R001 180k
C025 0.001
R031 4.7k
C039 2.2/6.3V
C032 330p
C029 0.001
IC003
IC002
R035 10k
R034 10k
C030 0.047
R032 22k
C031 100p
OUT GND IN
FL003
R045 3.9k
C034 47p
R011 47k
C049 100p
CV001 20p
R027 22k
R021 22k
R039 3.9k
OUT
FL001
GND
IN
L002 150µH
Q003
L005 330µH
X002
R054
RV001 22k
RV002 10k
ACK C (33) 3.4
BURST P (34) 0(0.1)
ACK DC (35)
SYSTEM R (36) 0
H SYNC (37)
CAR (45)
VCO ADJ (47)
ACC (48)
CAR B (49)
C EMP (50)
PB C RF (51) 2.9 (1.8)
REC C RF (52) 0.8(0.6)
COMB IN C (53) 0
COMB OUT C (54) 3.3
1-619-918-
11
1
2
3
4
5
6
7

VC-10 BOARD (A SIDE)

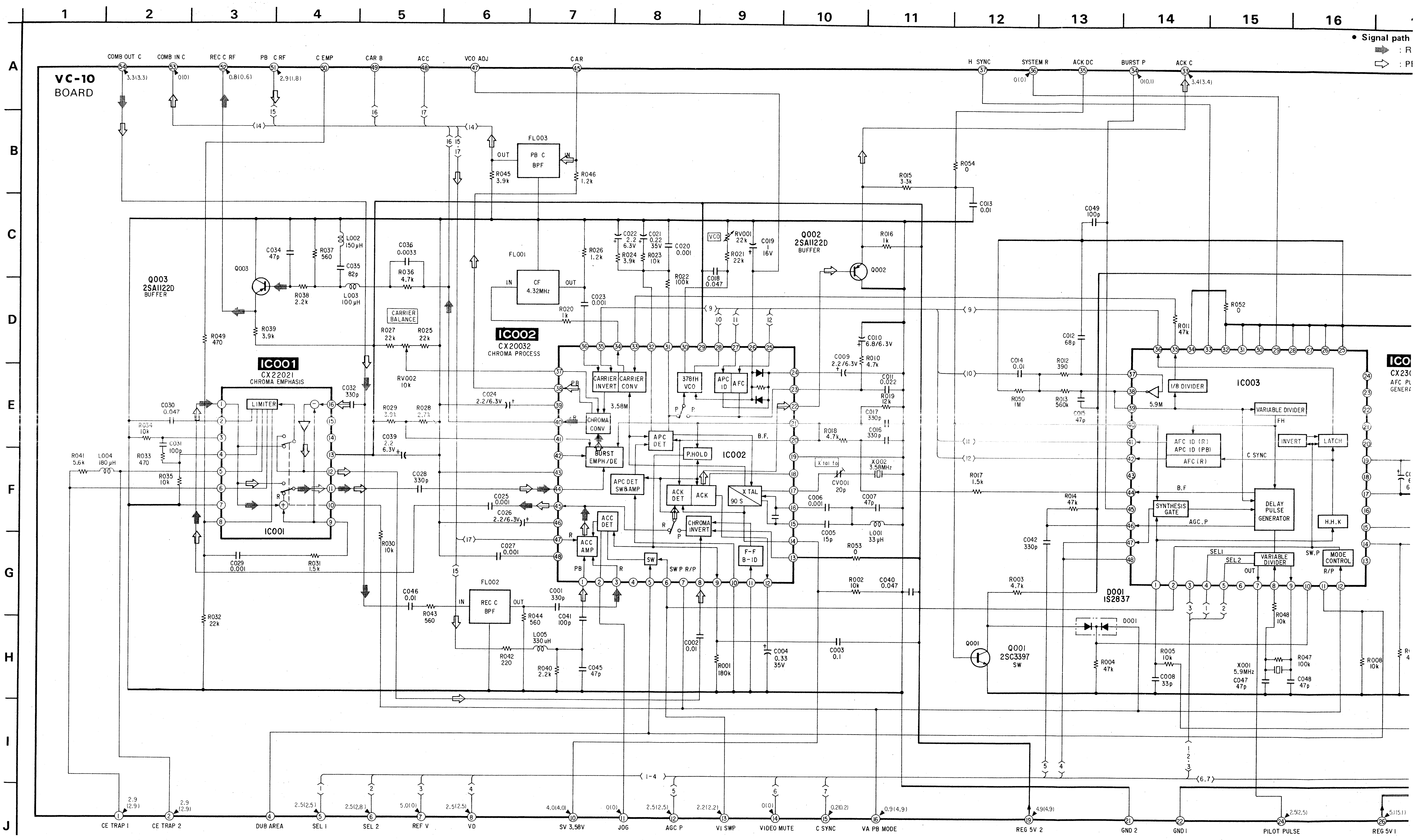

CE TRAP 1 (1)
CE TRAP 2 (2)
DUB AREA (4)
SEL 1 (5)
SEL 2 (6)
REF V (7)
VD (8)
SV 3.58V (10)
JOG (11)
AGC P (12)
VI SWP (13)
VIDEO MUTE (14)
C SYNC
R041 5.6k
C046 0.01
C002 0.01
R043 560
C003 0.1
R044 560
IC001
C041 100p
C001 330p
C027 0.001
C028 330p
C026 2.2/6.3V
R002 10k
R029 3.9k
R033 470
R049 470
C024 2.2/6.3V
R028 2.7k
C018 0.047
R046 1.2k
C036 0.0033
R037 560
L003 100µH
R036 4.7k
C019 1/16V
C020 0.001
C021 0.22/35V
R038 2.2k
C035 82p
R024 3.9k
R022 100k
R023 10k
C023 0.001
R010 4.7k
C045 47p
R040 2.2k
C022 2.2/6.3V
C011 0.022
R025 22k
R026 1.2k
R042 220
R020 1k
C010 6.8/6.3V
C009 2.2/6.3V
COMB OUT C (54)
COMB IN C (53)
REC C RF (52)
PB C RF (51)
C EMP (50)
CAR B (49)
ACC (48)
VCO ADJ (47)
CAR (45)
8
9
10
11

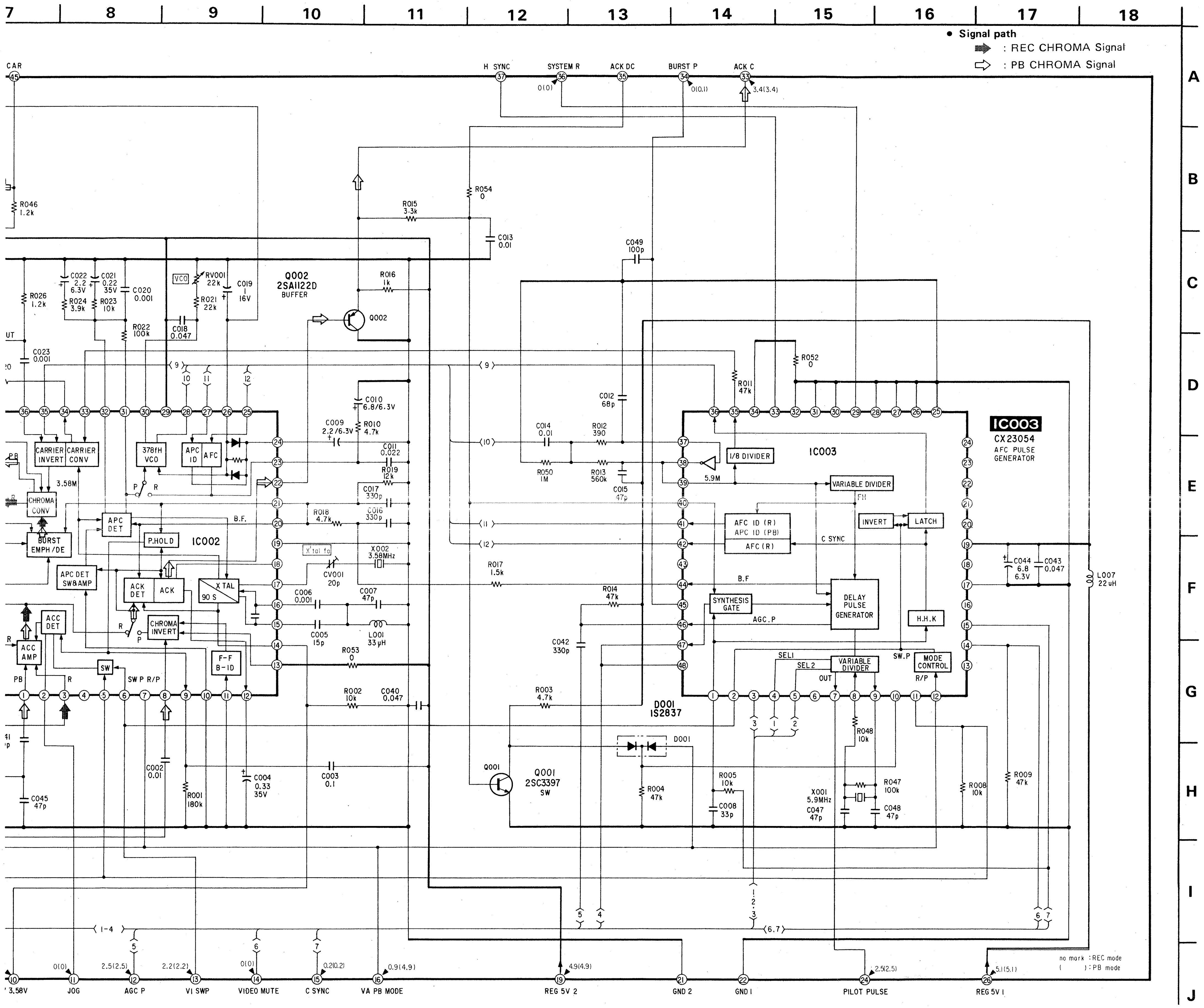

SV 3.58V ⑩
VD ⑧ 2.5
REF V ⑦ 5(0)
SEL 2 ⑥ 2.5 (2.8)
SEL 1 ⑤ 2.5 (2.5)
DUB AREA ④ 0
CE TRAP 2 ② 2.9
CE TRAP 1 ① 2.9
L004 180μH
R030 10k
FL002 OUT GND IN
C025 0.001
C039 2.2/6.3V
C032 330p
R031 4.7k
C029 0.001
R035 10k
R034 10k
C030 0.047
R032 22k
C031 100p
FL003 OUT GND IN
R045 3.9k
C034 47p
L002 150μH
Q003
L005 330μH
FL001 OUT GND IN
RV002 10k
48 46 43 40 37 34 36
CAR ㊺
VCO ADJ ㊼
ACC ㊽
CAR.B ㊾
C.EMP ㊿
PB.C RF (51) 2.9 (1.8)
REC.C RF (52) 0.8 (0.6)
COMB IN C (53) 0
COMB OUT C (54) 3.3
11
5
6
7

VC-10 BOARD (A SIDE)


CE TRAP 1 ①
CE TRAP 2 ②
DUB AREA ④
SEL 1 ⑤
SEL 2 ⑥
REF V ⑦
VD ⑧
SV 3.58V ⑩
JOG ⑪
AGC P ⑫
V1 SWP ⑬
VIDEO MUTE ⑭
C SYNC ⑮
VA PB MODE ⑯
REG 5V 2 ⑲
GND 2 ㉑
GND 1 ㉒
PILOT PULSE ㉔
REG 5V 1 ㉖
R041 5.6k
C046 0.01
C002 0.01
R043 560
R044 560
C003 0.1
C004 0.33/35V
R047 100k
C043 0.047
R009 47k
IC001 16 13 9 1 4 8
C041 100p
C001 330p
C027 0.001
C047 47p
C048 47p
C008 33p
R048 10k
C044 6.8/6.3V
C028 330p
C026 2.2/6.3V
R002 10k
R053
R029 3.9k
R005 10k
C042 330p
R033 470
R049 470
C024 2.2/6.3V
R028 2.7k
C018 0.047
C040 0.047
R046 1.2k
C036 0.0033
C015 47p
R014 47k
R037 560
L003 100μH
R036 4.7k
C020 0.001
C019 1/16V
C021 0.22/35V
C014 0.01
R013 560k
R012 390
R008 10k
C012 68p
R038 2.2k
C035 82p
R024 3.9k
R022 100k
R023 10k
Q002
R016 1k
R003 4.7k
C023 0.001
R010 4.7k
R015 3.3k
C006 0.001
C005 15p
R050 1M
C045 47p
R040 2.2k
C022 2.2/6.3V
C011 0.022
R052
L001 33μH
Q001
R025 22k
R026 1.2k
C013 0.01
C007 47p
C010 6.8/6.3V
C009 2.2/6.3V
R019 12k
C017 330p
D001
R042 220
R020 1k
R018 4.7k
R017 1.5k
R004 47k
C016 33p
COMB OUT C (54)
COMB IN C (53)
REC C RF (52)
PB C RF (51)
C EMP ㊿
CAR.B ㊾
ACC ㊽
VCO ADJ ㊼
CAR ㊺
H SYNC ㊲
SYSTEM R ㊱
ACK DC ㉟
BURST P ㉞
ACK C ㉝
1-619-918-
11
8
9
10
11
12
13
14

VC-10(CHROMA SIGNAL PROCESS)SCHEMATIC DIAGRAM


VC-10 BOARD
Signal path
: R
: P
COMB OUT C
COMB IN C
REC C RF
PB C RF
C EMP
CAR B
ACC
VCO ADJ
CAR
H SYNC
SYSTEM R
ACK DC
BURST P
ACK C
IC001
CX22021
CHROMA EMPHASIS
LIMITER
IC002
CX20032
CHROMA PROCESS
IC003
Q003
2SA1122D
BUFFER
Q002
2SA1122D
BUFFER
Q001
2SC3397
SW
D001
1S2837
FL001
CF
4.32MHz
FL002
REC C
BPF
FL003
PB C
BPF
CARRIER BALANCE
CARRIER INVERT
CARRIER CONV
378fH VCO
APC ID
AFC
CHROMA CONV
BURST EMPH/DE
APC DET
P.HOLD
APC DET SW&AMP
ACK DET
ACK
X TAL 90 S
ACC DET
ACC AMP
SW
CHROMA INVERT
F-F B-ID
1/8 DIVIDER
VARIABLE DIVIDER
AFC ID (R)
APC ID (PB)
AFC (R)
INVERT
LATCH
C SYNC
DELAY PULSE GENERATOR
SYNTHESIS GATE
AGC.P
H.H.K
MODE CONTROL
X001 5.9MHz
X002 3.58MHz
CE TRAP 1
CE TRAP 2
DUB AREA
SEL 1
SEL 2
REF V
VD
SV 3.58V
JOG
AGC P
V1 SWP
VIDEO MUTE
C SYNC
VA PB MODE
REG 5V 2
GND 2
GND 1
PILOT PULSE
REG 5V 1
CX23
AFC P
GENER

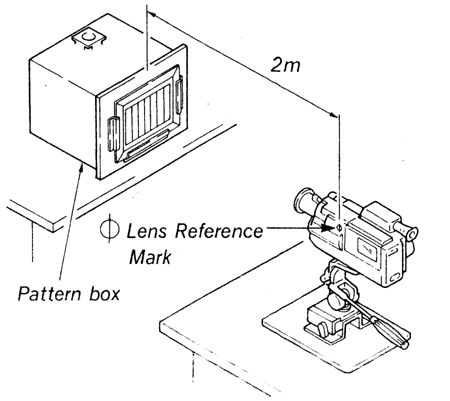


• Signal path
: REC CHROMA Signal
: PB CHROMA Signal
IC003
CX23054
AFC PULSE GENERATOR
IC002
Q002
2SA1122D
BUFFER
Q001
2SC3397
SW
D001
1S2837
X002 3.58MHz
X001 5.9MHz
L001 33μH
L007 22uH
CARRIER INVERT
CARRIER CONV
378fH VCO
APC ID
AFC
CHROMA CONV
BURST EMPH/DE
APC DET
P.HOLD
APC DET SW&AMP
ACK DET
ACK
X TAL 90 S
ACC DET
ACC AMP
CHROMA INVERT
F-F B-ID
SW
1/8 DIVIDER
VARIABLE DIVIDER
AFC ID (R)
APC ID (PB)
AFC (R)
INVERT
LATCH
SYNTHESIS GATE
DELAY PULSE GENERATOR
H.H.K
MODE CONTROL
H SYNC
SYSTEM R
ACK DC
BURST P
ACK C
3.58V
JOG
AGC P
VI SWP
VIDEO MUTE
C SYNC
VA PB MODE
REG 5V 2
GND 2
GND 1
PILOT PULSE
REG 5V 1
no mark : REC mode
( ) : PB mode

Note:

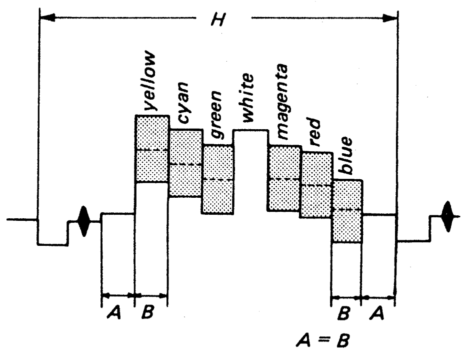
- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ▭ : adjustment for repair.
- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection



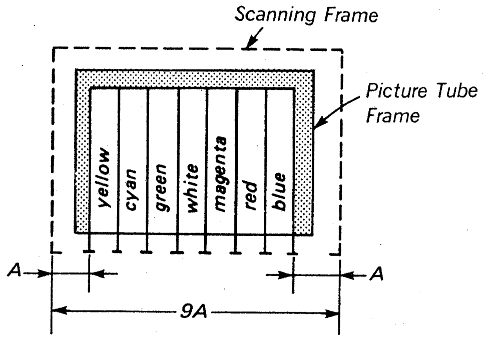
2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.



H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.



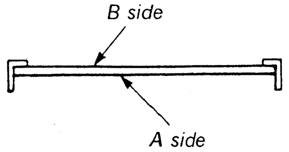
Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

VY-8(Y SIGNAL PROCESS) PRINTED WIRING BOARD

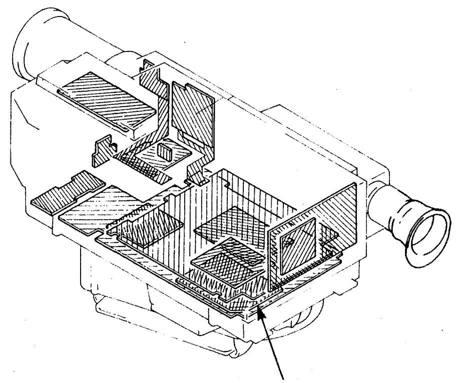
Note:

- ● ○— : indicates a lead wire mounted on the component side.
- ● ●— : indicates a lead wire mounted on the printed side.
- ● ⊗ : Through hole.
- ● ▨ : Pattern from the side which enables seeing.
- ● ▨ : Pattern of the rear side.
- ● ▨ : B+ pattern from the side which enables seeing.

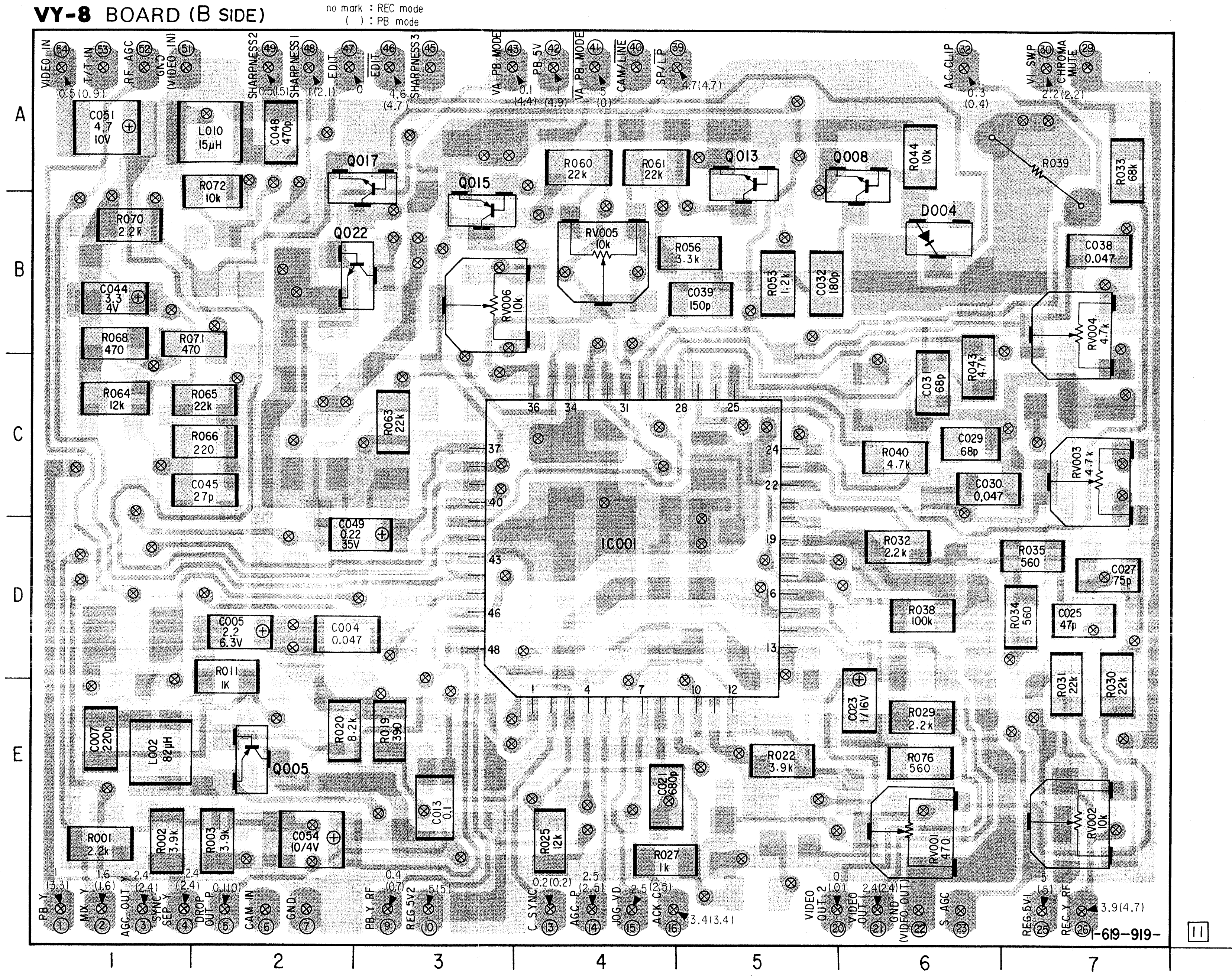

B side
A side

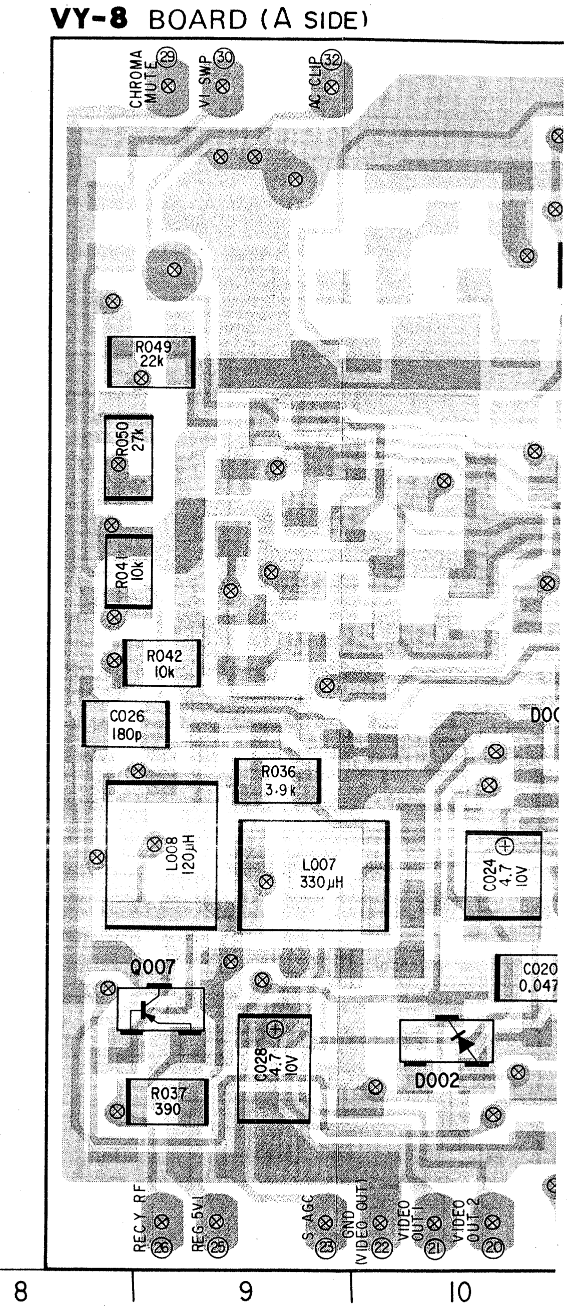
Note
Soldering side : Parts on the soldering side being
(SIDE A) seen from the soldering are stated.
Component side : Parts on the component side being
(SIDE B) seen from the component are stated.
Regarding color indication of patterns

- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.

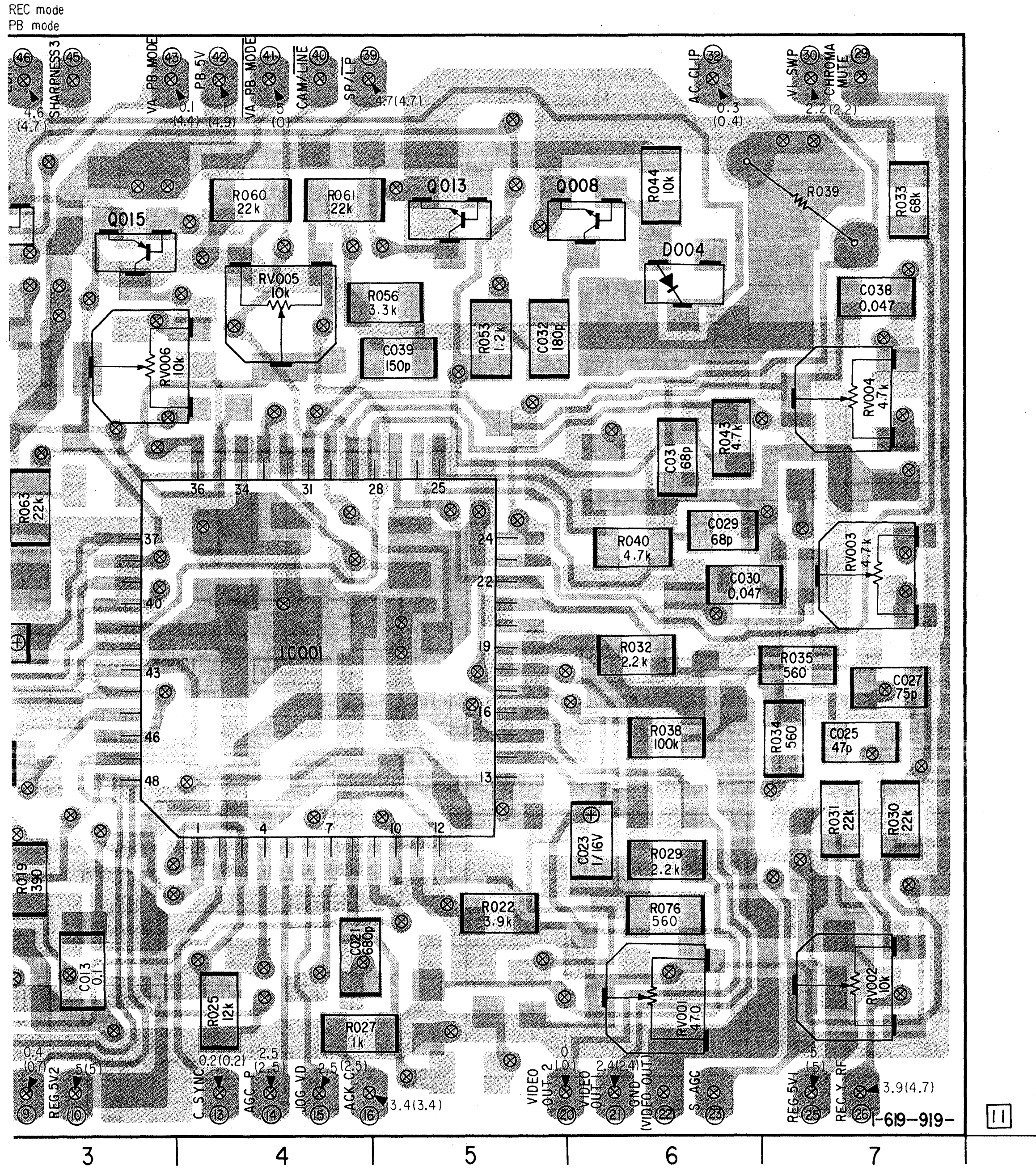


VY-8
(Y Signal Process)

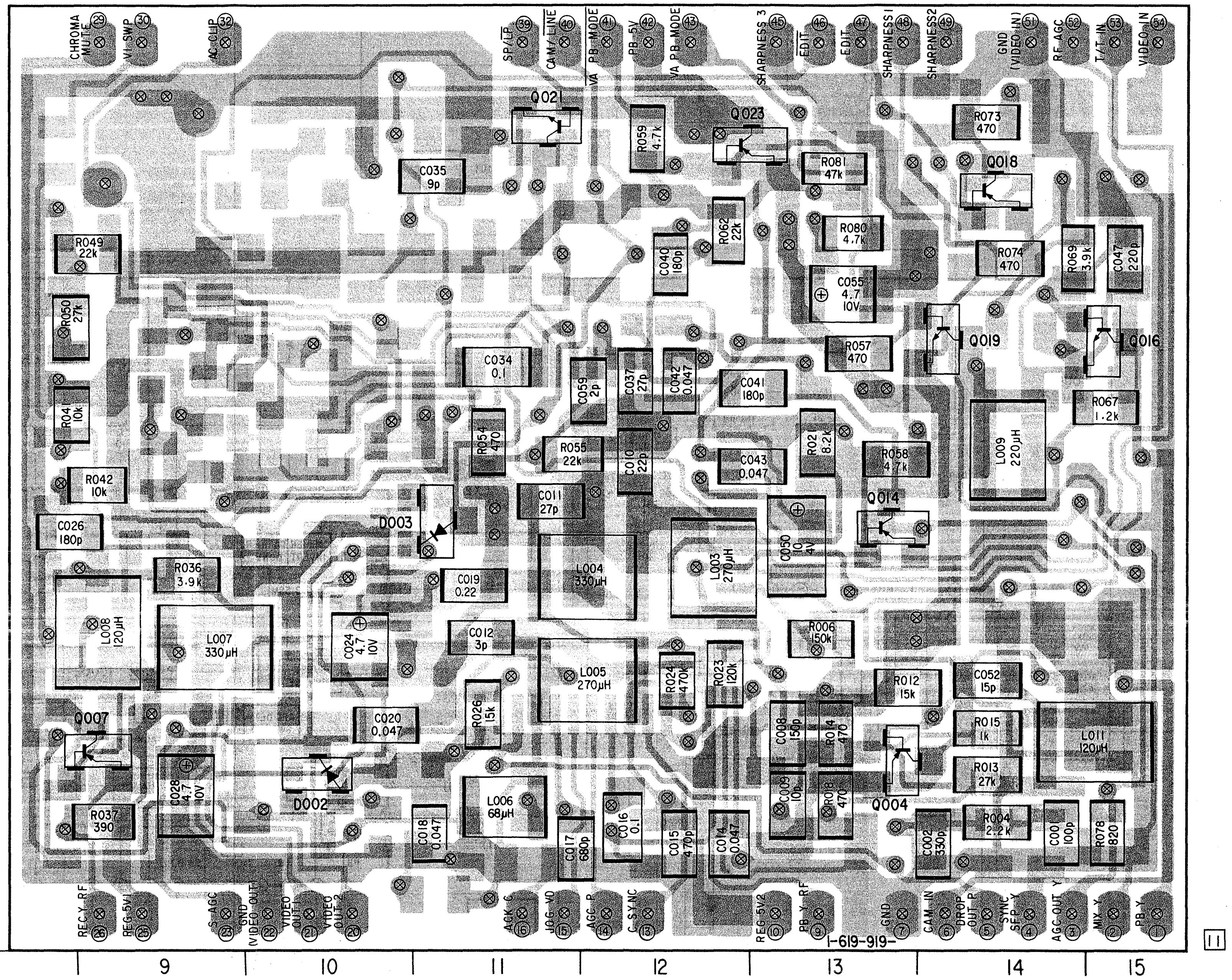

VY-8 BOARD (B SIDE)
no mark : REC mode
( ) : PB mode
VIDEO IN 54
T/T IN 53
RF AGC 52
GND (VIDEO IN) 51
SHARPNESS2 49
SHARPNESS1 48
EDIT 47
EDIT 46
SHARPNESS3 45
VA PB MODE 43
PB 5V 42
VA PB MODE 41
CAM/LINE 40
SP/LP 39
AC CLIP 32
VI SWP 30
CHROMA MUTE 29
A
B
C
D
E
C051 4.7 10V
L010 15μH
C048 470p
Q017
Q015
Q013
Q008
R060 22k
R061 22k
R044 10k
R039
R033 68k
R072 10k
R070 2.2k
Q022
D004
RV005 10k
R056 3.3k
C038 0.047
C044 3.3 4V
RV006 10k
C039 150p
R053 1.2k
C032 180p
RV004 4.7k
R068 470
R071 470
C031 68p
R043 4.7k
R064 12k
R065 22k
R063 22k
R066 220
C045 27p
R040 4.7k
C029 68p
C030 0.047
RV003 4.7k
C049 0.22 35V
IC001
R032 2.2k
R035 560
C027 75p
C005 2.2 6.3V
C004 0.047
R038 100k
R034 560
C025 47p
R011 1K
C023 1/16V
R031 22k
R030 22k
C007 220p
L002 82μH
R020 8.2k
R019 390
R029 2.2k
Q005
C013 0.1
C021 680p
R022 3.9k
R076 560
R001 2.2k
R002 3.9k
R003 3.9k
C054 10/4V
R025 12k
R027 1k
RV001 470
RV002 10k
PB Y 1
MIX Y 2
AGC OUT 3
SYNC SEP 4
DROP OUT P 5
CAM IN 6
GND 7
PB Y RF 9
REG 5V2 10
C SYNC 13
AGC P 14
JOG VD 15
ACK CS 16
VIDEO OUT 2 20
VIDEO OUT 1 21
GND (VIDEO OUT) 22
S AGC 23
REG 5V1 25
REC Y RF 26
1-619-919-
11
1
2
3
4
5
6
7
8


VY-8 BOARD (A SIDE)
CHROMA MUTE 29
VI SWP 30
AC CLIP 32
R049 22k
R050 27k
R041 10k
R042 10k
C026 180p
R036 3.9k
L008 120μH
L007 330μH
C024 4.7 10V
C020 0.047
Q007
C028 4.7 10V
D002
R037 390
REC Y RF 26
REG 5V1 25
S AGC 23
GND (VIDEO OUT) 22
VIDEO OUT 1 21
VIDEO OUT 2 20
9
10

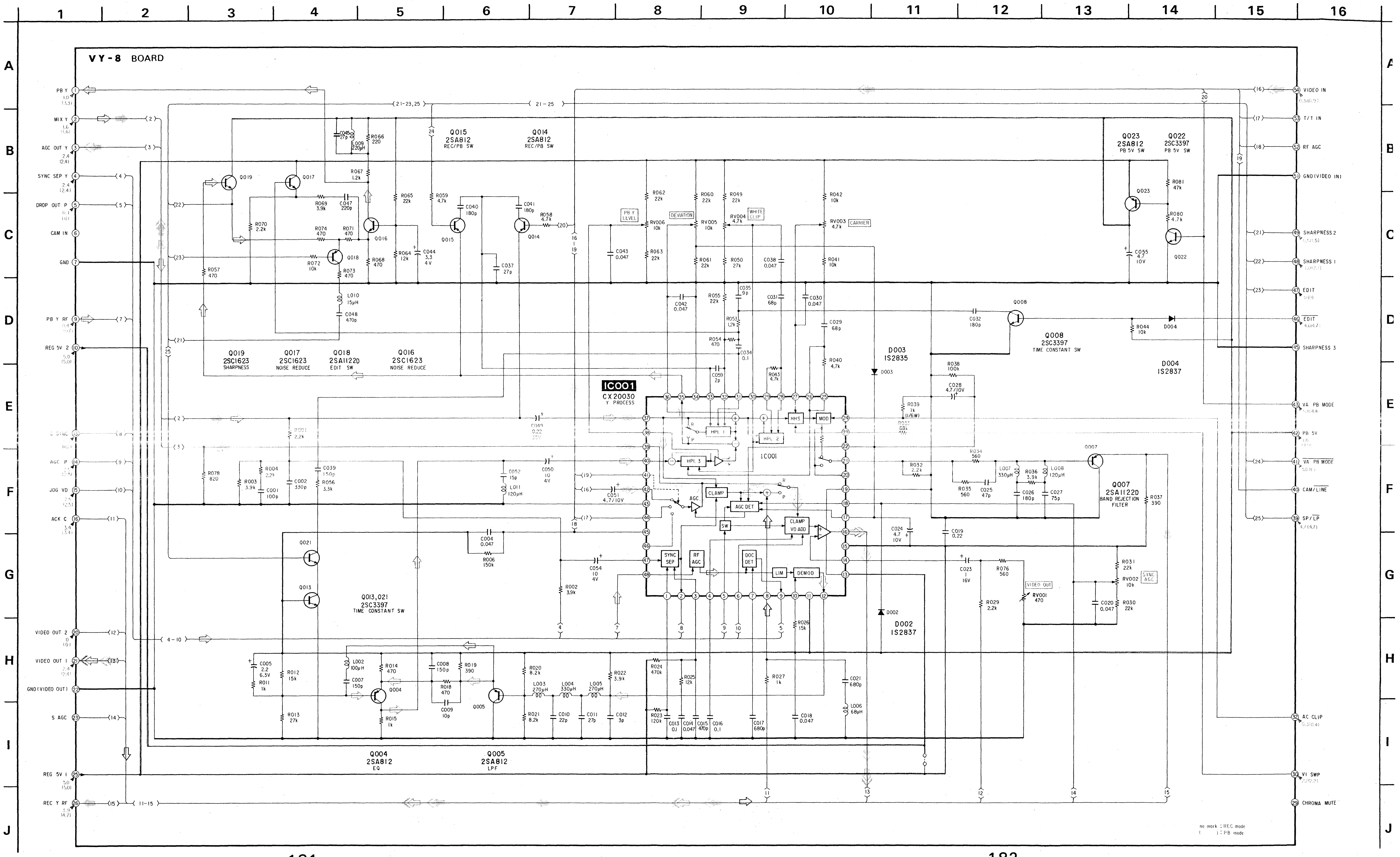
ƆARD

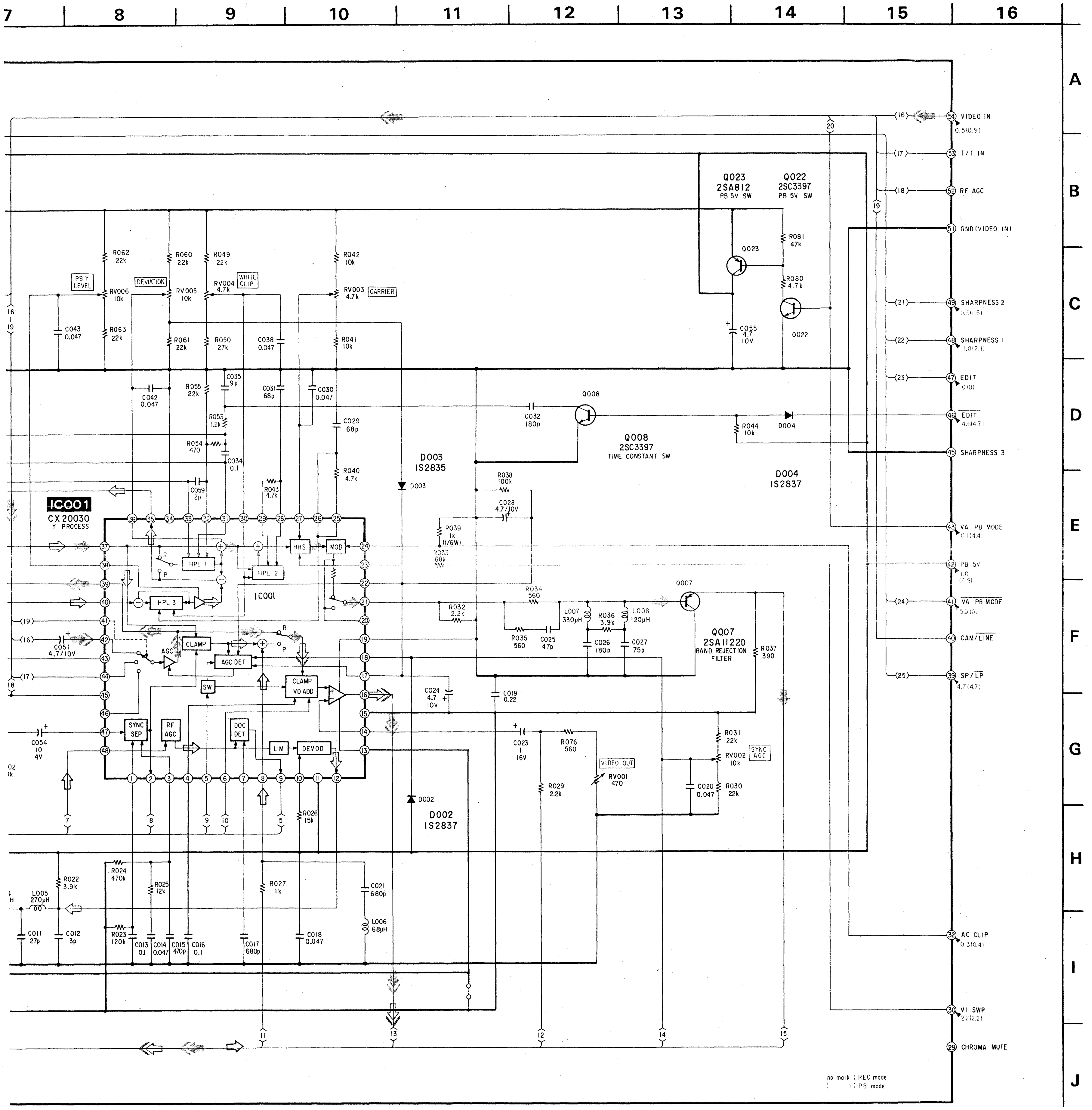

REC mode
PB mode
SHARPNESS3
VA PB MODE
PB 5V
VA PB MODE
CAM/LINE
SP/LP
AC CLIP
V1 SWP
CHROMA MUTE
Q015
R060 22k
R061 22k
Q013
Q008
R044 10k
R039
R033 68k
D004
RV005 10k
R056 3.3k
RV006 10k
C039 150p
R053 1.2k
C032 180p
C038 0.047
RV004 4.7k
C031 68p
R043 4.7k
R063 22k
IC001
R040 4.7k
C029 68p
C030 0.047
RV003 4.7k
R032 2.2k
R035 560
C027 75p
R038 100k
R034 560
C025 47p
C023 1/16V
R029 2.2k
R031 22k
R030 22k
R019 390
R022 3.9k
R076 560
C013 0.1
C021 680p
R025 12k
R027 1k
RV001 470
RV002 10k
REG 5V2
C SYNC
AGC P
JOG VD
ACK C
VIDEO OUT 2
VIDEO OUT 1
GND (VIDEO OUT)
S AGC
REG 5V1
REC Y RF
1-619-919-
11
3
4
5
6
7
8

VY-8 BOARD (A SIDE)


CHROMA MUTE
V1 SWP
AC CLIP
SP/LP
CAM/LINE
VA PB MODE
PB 5V
VA PB MODE
SHARPNESS 3
EDIT
EDIT
SHARPNESS1
SHARPNESS2
GND (VIDEO IN)
RF AGC
T/T IN
VIDEO IN
Q021
Q023
R073 470
R059 4.7k
C035 9p
R081 47k
Q018
R062 22k
R080 4.7k
R049 22k
C040 180p
R074 470
R069 3.9k
C047 220p
C055 4.7 10V
R050 27k
Q019
Q016
R057 470
C034 0.1
C059 2p
C037 27p
C042 0.047
C041 180p
R067 1.2k
R041 10k
R054 470
R055 22k
C010 22p
R021 8.2k
R058 4.7k
L009 220μH
C043 0.047
R042 10k
D003
C011 27p
Q014
C026 180p
L004 330μH
L003 270μH
C050 10 4V
R036 3.9k
C019 0.22
L008 120μH
L007 330μH
C024 4.7 10V
C012 3p
R006 150k
L005 270μH
R024 470k
R023 120k
R012 15k
C052 15p
R026 15k
C008 150p
R014 470
R015 1k
Q007
C020 0.047
L011 120μH
R013 27k
C028 4.7 10V
D002
C009 10p
R018 470
Q004
L006 68μH
C016 0.1
R037 390
C018 0.047
C017 680p
C015 470p
C014 0.047
C002 330p
R004 2.2k
C001 100p
R078 820
REC Y RF
REG 5V1
S AGC
GND (VIDEO OUT)
VIDEO OUT 1
VIDEO OUT 2
ACK C
JOG VD
AGC P
C SYNC
REG 5V2
PB Y RF
GND
CAM IN
DROP OUT P
SYNC SEP
AGC OUT Y
MIX Y
PB Y
1-619-919-
11
9
10
11
12
13
14
15

VY-8(Y SIGNAL PROCESS) SCHEMATIC DIAGRAM


VY-8 BOARD
PB Y
MIX Y
AGC OUT Y
SYNC SEP Y
DROP OUT P
CAM IN
GND
PB Y RF
REG 5V 2
C SYNC
AGC P
JOG VD
ACK C
VIDEO OUT 2
VIDEO OUT 1
GND (VIDEO OUT)
S AGC
REG 5V 1
REC Y RF
VIDEO IN
T/T IN
RF AGC
GND (VIDEO IN)
SHARPNESS 2
SHARPNESS 1
EDIT
EDIT
SHARPNESS 3
VA PB MODE
PB 5V
VA PB MODE
CAM/LINE
SP/LP
AC CLIP
VI SWP
CHROMA MUTE
Q019 2SC1623 SHARPNESS
Q017 2SC1623 NOISE REDUCE
Q018 2SA1122D EDIT SW
Q016 2SC1623 NOISE REDUCE
Q015 2SA812 REC/PB SW
Q014 2SA812 REC/PB SW
Q023 2SA812 PB 5V SW
Q022 2SC3397 PB 5V SW
Q008 2SC3397 TIME CONSTANT SW
Q007 2SA1122D BAND REJECTION FILTER
Q013,021 2SC3397 TIME CONSTANT SW
Q004 2SA812 EQ
Q005 2SA812 LPF
D003 1S2835
D004 1S2837
D002 1S2837
IC001 CX20030 Y PROCESS
PB Y LEVEL
DEVIATION
WHITE CLIP
CARRIER
VIDEO OUT
SYNC AGC
HPL 1
HPL 2
HPL 3
HHS
MOD
CLAMP
AGC
AGC DET
SW
CLAMP VD ADD
SYNC SEP
RF AGC
DOC DET
LIM
DEMOD
no mark : REC mode
( ) : PB mode

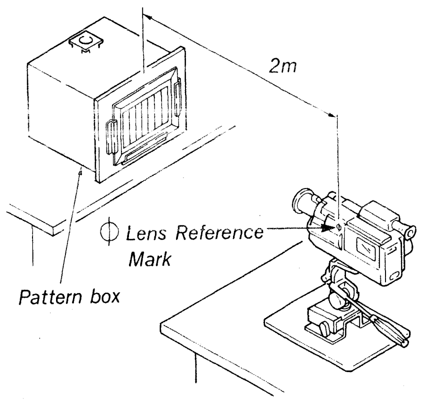

7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
IC001
CX20030
Y PROCESS
Q023
2SA812
PB 5V SW
Q022
2SC3397
PB 5V SW
Q008
2SC3397
TIME CONSTANT SW
Q007
2SA1122D
BAND REJECTION FILTER
D003
1S2835
D004
1S2837
D002
1S2837
PB Y LEVEL
DEVIATION
WHITE CLIP
CARRIER
VIDEO OUT
SYNC AGC
RV006 10k
RV005 10k
RV004 4.7k
RV003 4.7k
RV002 10k
RV001 470
HPL 1
HPL 2
HPL 3
HHS
MOD
CLAMP
AGC
AGC DET
SW
CLAMP VD ADD
SYNC SEP
RF AGC
DOC DET
LIM
DEMOD
VIDEO IN 0.5(0.9)
T/T IN
RF AGC
GND(VIDEO IN)
SHARPNESS 2
SHARPNESS 1
EDIT
EDIT
SHARPNESS 3
VA PB MODE
PB 5V
VA PB MODE
CAM/LINE
SP/LP
AC CLIP
V1 SWP
CHROMA MUTE
no mark : REC mode
( ) : PB mode

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- ▭ : Nonflammable resistor
- ——— : B+ bus.
- ▭ : adjustment for repair.
- **Signal path**
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ⇨ : PB CHROMA Signal
  - ⇨ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal

- Voltage and waveform measuring conditions:
  (1) Sample object: Pattern box color bars.
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

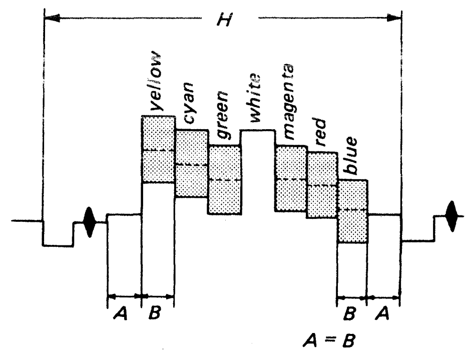

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

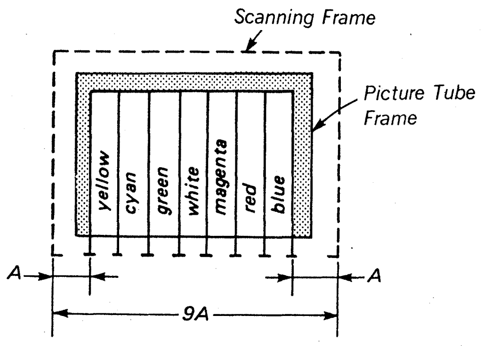
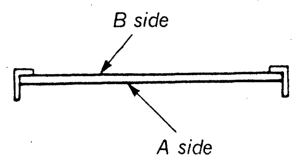

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

VD-5(COMB FILTER) PRINTED WIRING BOARD

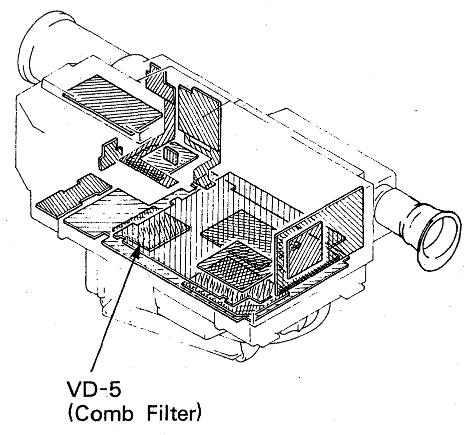
Note:

- ○-- : indicates a lead wire mounted on the component side.
- ●-- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- ▨ : B+ pattern from the side which enables seeing.


B side
A side

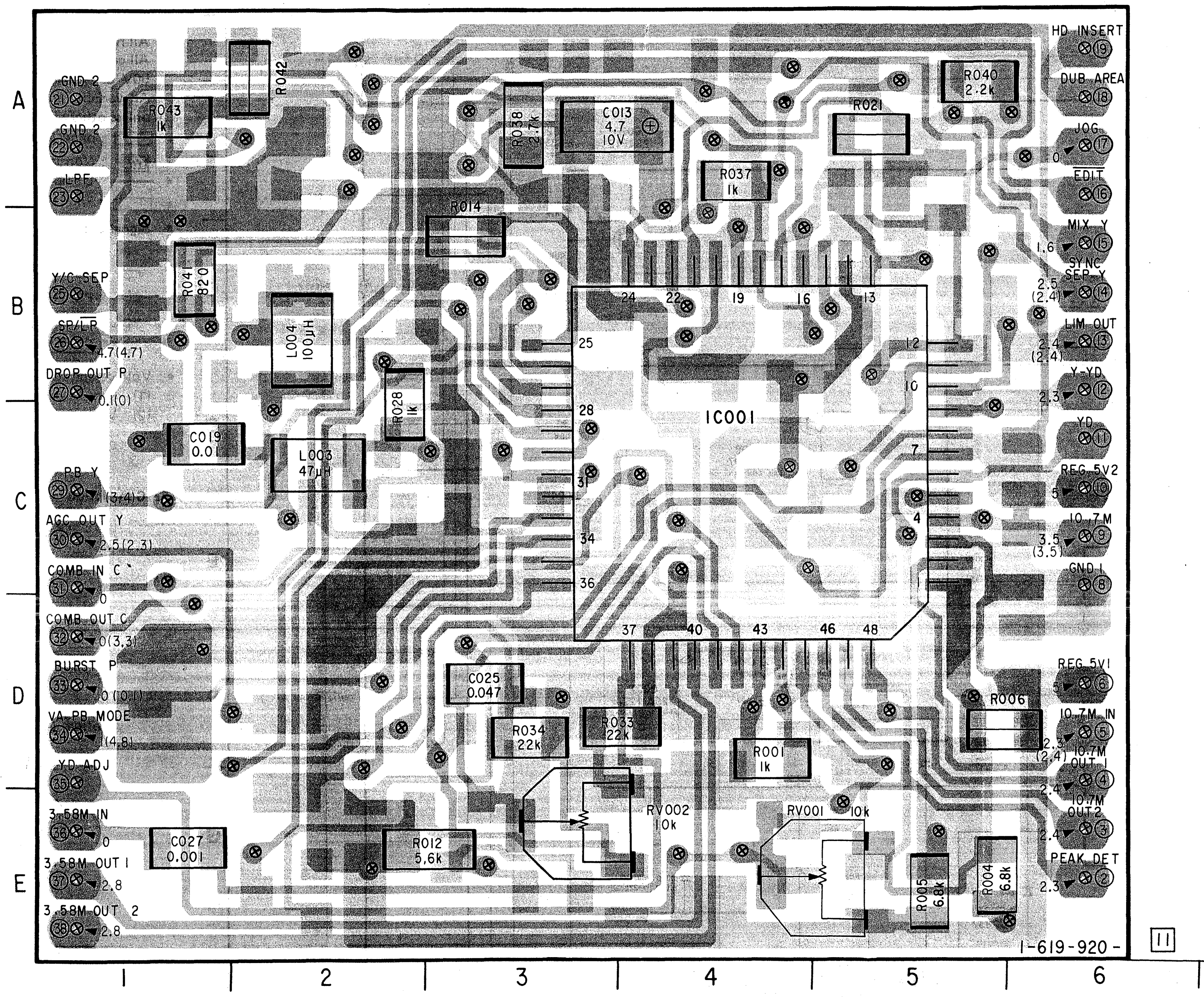
Note
Soldering side : Parts on the soldering side being
(SIDE A) seen from the soldering are stated.
Component side : Parts on the component side being
(SIDE B) seen from the component are stated.
Regarding color indication of patterns

- Patterns being seen in the state from the surface side are indicated in gray pattern and red pattern (B+ pattern).
- Pattern being seen in the state of the rear surface side is indicated in green pattern.

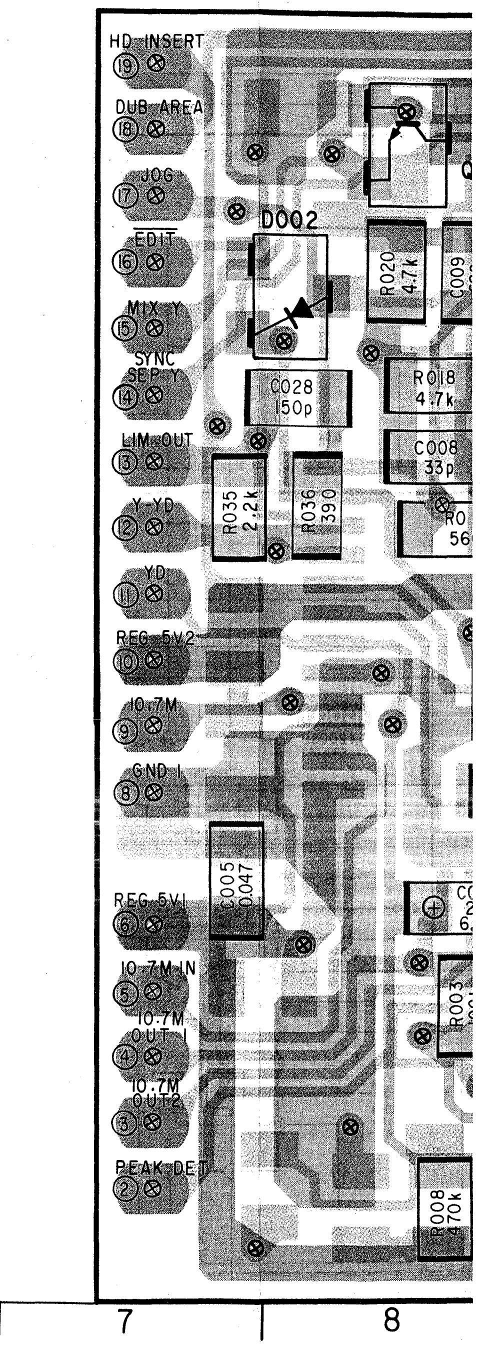

VD-5
(Comb Filter)

VD-5 BOARD (B SIDE)

no mark : REC mode
( ) : PB mode


A
B
C
D
E
1
2
3
4
5
6
HD INSERT ⑲
DUB AREA ⑱
JOG ⑰
EDIT ⑯
MIX Y ⑮
SYNC SEP Y ⑭
LIM OUT ⑬
Y-YD ⑫
YD ⑪
REG 5V2 ⑩
10.7M ⑨
GND I ⑧
REG 5V1 ⑥
10.7M IN ⑤
10.7M OUT I ④
10.7M OUT2 ③
PEAK DET ②
GND 2 ㉑
GND 2 ㉒
LPF ㉓
Y/C SEP ㉕
SP/LP ㉖
DROP OUT P ㉗
PB Y ㉙
AGC OUT Y ㉚
COMB IN C ㉛
COMB OUT C ㉜
BURST P ㉝
VA PB MODE ㉞
YD ADJ ㉟
3.58M IN (36)
3.58M OUT I (37)
3.58M OUT 2 (38)
4.7(4.7)
0.1(0)
(3.4)
2.5(2.3)
0
0(3.3)
0(0.1)
(4.8)
0
2.8
2.8
0
1.6
2.5 (2.4)
2.4 (2.4)
2.3
5
3.5 (3.5)
5
2.3 (2.4)
2.4
2.4
2.3
R043 1k
R042
R038 2.7k
C013 4.7 10V
R021
R040 2.2k
R037 1k
R014
R041 820
L004 100µH
R028 1k
C019 0.01
L003 47µH
IC001
24
22
19
16
13
25
12
28
10
31
7
34
4
36
1
37
40
43
46
48
C025 0.047
R034 22k
R033 22k
R001 1k
R006
RV002 10k
RV001 10k
R012 5.6k
C027 0.001
R005 6.8k
R004 6.8k
1-619-920- 11

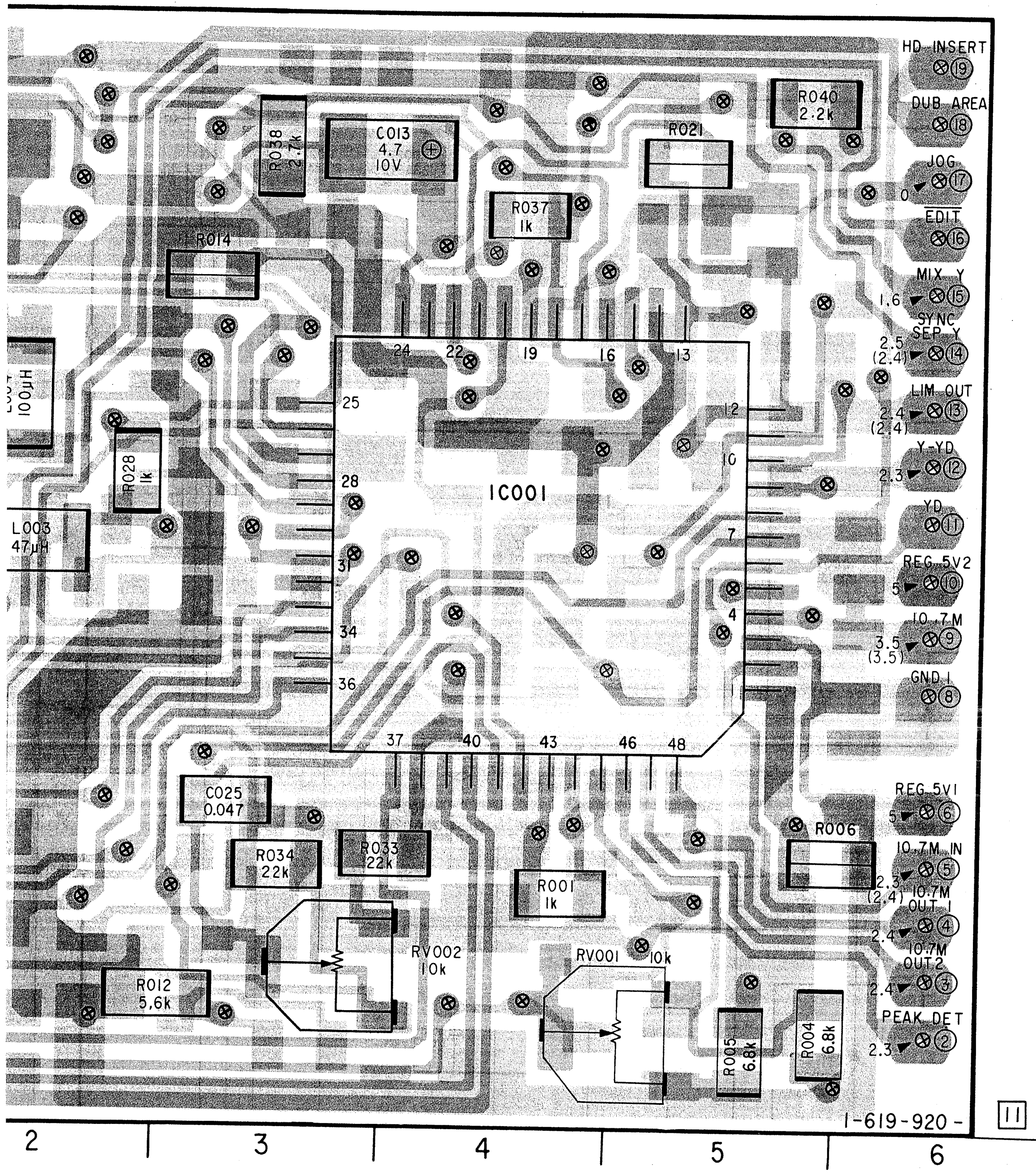
VD-5 BOARD (A SIDE)


7
8
HD INSERT ⑲
DUB AREA ⑱
JOG ⑰
EDIT ⑯
MIX Y ⑮
SYNC SEP Y ⑭
LIM OUT ⑬
Y YD ⑫
YD ⑪
REG 5V2 ⑩
10.7M ⑨
GND I ⑧
REG 5V1 ⑥
10.7M IN ⑤
10.7M OUT ④
10.7M OUT2 ③
PEAK DET ②
Q
D002
R020 4.7k
C009
C028 150p
R018 4.7k
C008 33p
R035 2.2k
R036 390
C005 0.047
R008 470k

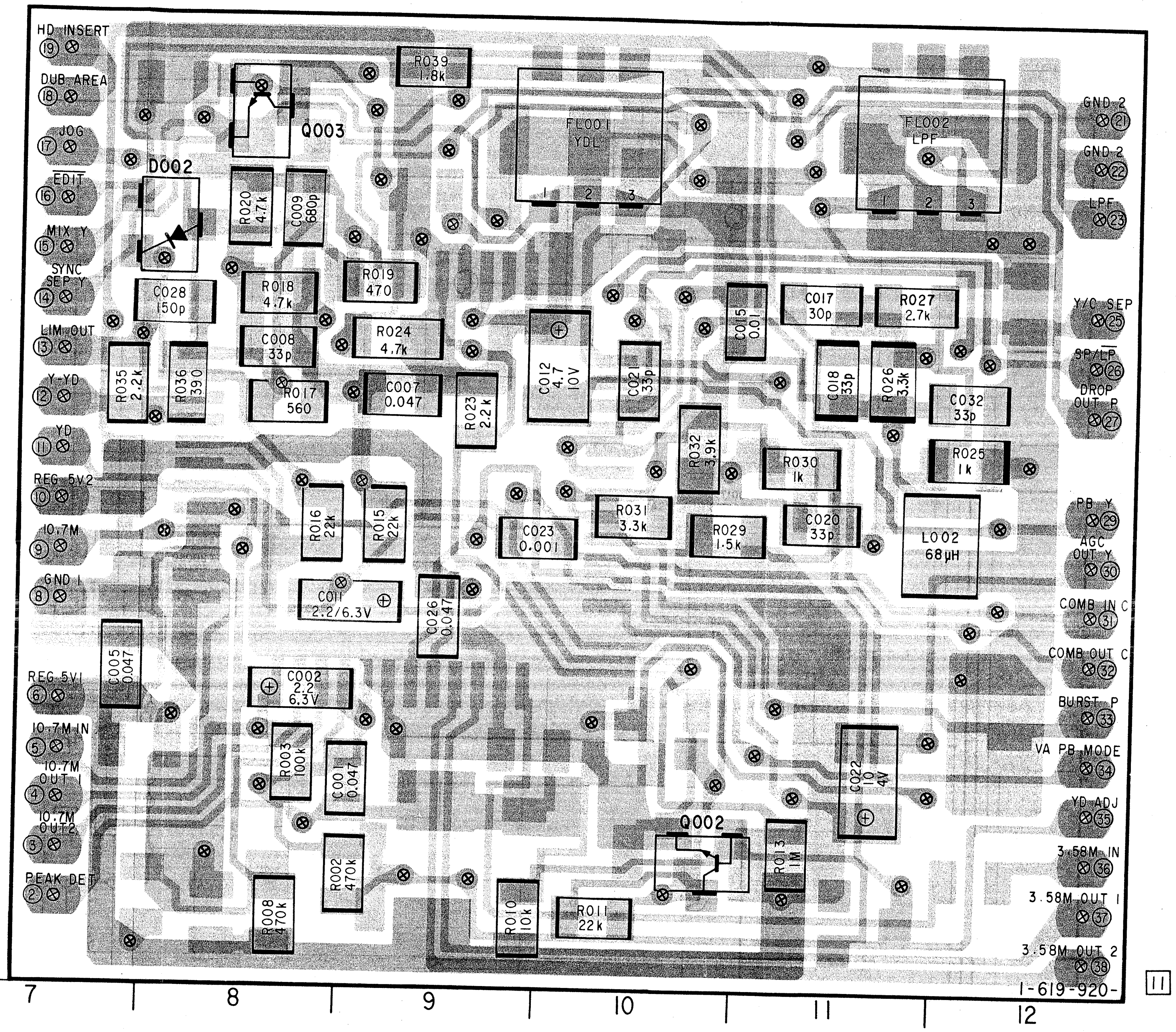
ING BOARD

E)

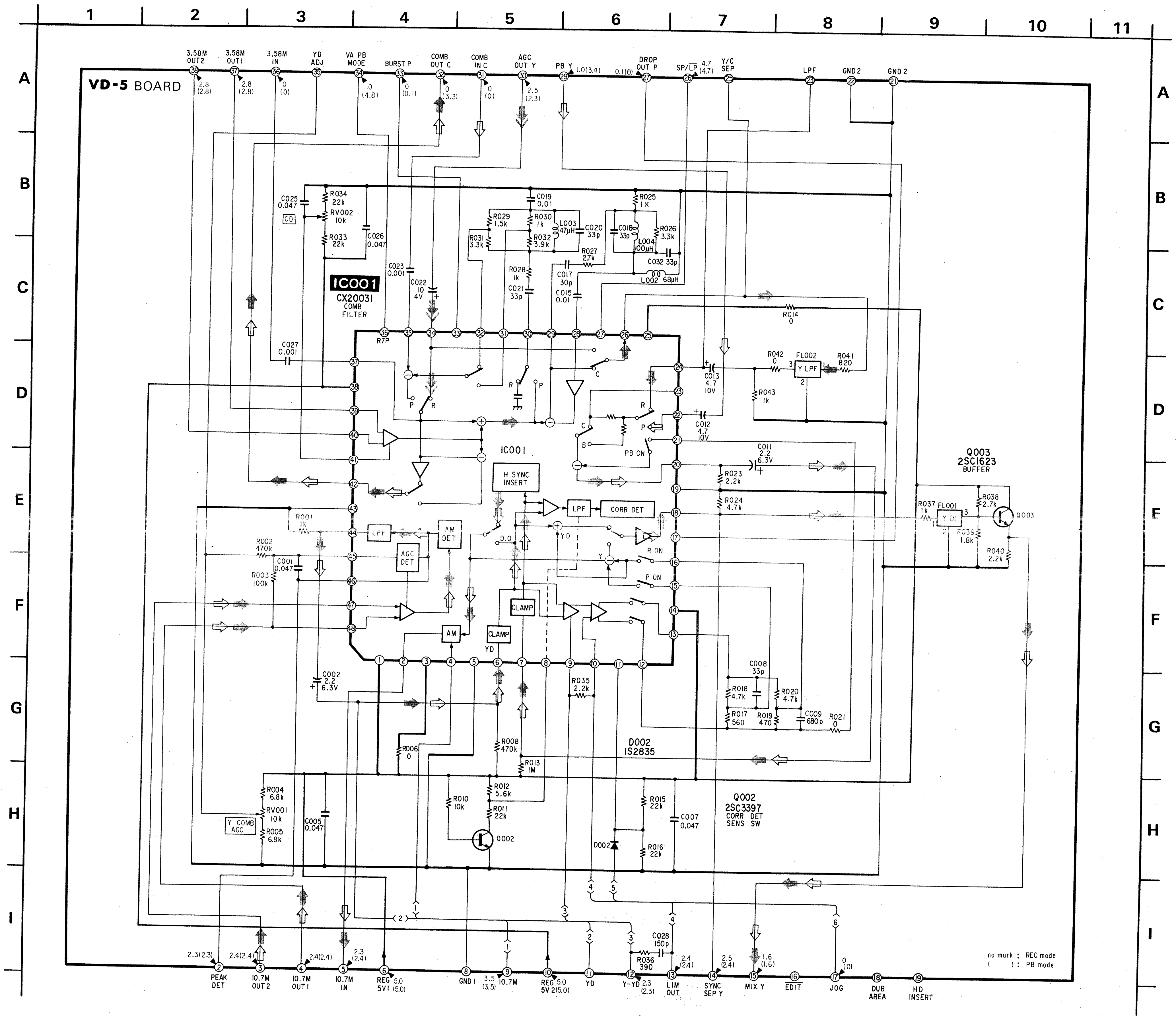
no mark : REC mode
( ) : PB mode


HD INSERT ⑲
DUB AREA ⑱
JOG ⑰
EDIT ⑯
MIX Y ⑮
1.6
SYNC SEP Y ⑭
2.5 (2.4)
LIM OUT ⑬
2.4 (2.4)
Y-YD ⑫
2.3
YD ⑪
REG 5V2 ⑩
5
10.7M ⑨
3.5 (3.5)
GND I ⑧
REG 5VI ⑥
5
10.7M IN ⑤
2.3 (2.4)
10.7M OUT ④
2.4
10.7M OUT2 ③
2.4
PEAK DET ②
2.3
R040 2.2k
C013 4.7 10V
R038 2.7k
R021
R037 1k
R014
IC001
L004 100µH
R028 1k
L003 47µH
C025 0.047
R034 22k
R033 22k
R001 1k
R006
RV002 10k
RV001 10k
R012 5.6k
R005 6.8k
R004 6.8k
1-619-920-
11
2
3
4
5
6

VD-5 BOARD (A SIDE)


HD INSERT ⑲
DUB AREA ⑱
JOG ⑰
EDIT ⑯
MIX Y ⑮
SYNC SEP Y ⑭
LIM OUT ⑬
Y-YD ⑫
YD ⑪
REG 5V2 ⑩
10.7M ⑨
GND I ⑧
REG 5VI ⑥
10.7M IN ⑤
10.7M OUT I ④
10.7M OUT2 ③
PEAK DET ②
GND 2 ㉑
GND 2 ㉒
LPF ㉓
Y/C SEP ㉕
SP/LP ㉖
DROP OUT P ㉗
PB Y ㉙
AGC OUT Y ㉚
COMB IN C ㉛
COMB OUT C ㉜
BURST P ㉝
VA PB MODE ㉞
YD ADJ ㉟
3.58M IN ㊱
3.58M OUT I ㊲
3.58M OUT 2 ㊳
Q003
D002
R039 1.8k
FL001 YDL
FL002 LPF
R020 4.7k
C009 680p
C028 150p
R018 4.7k
R019 470
C008 33p
R024 4.7k
R035 2.2k
R036 390
R017 560
C007 0.047
R023 2.2k
C012 4.7 10V
C021 33p
C015 0.01
C017 30p
R027 2.7k
C018 33p
R026 3.3k
C032 33p
R032 3.9k
R030 1k
R025 1k
R016 22k
R015 22k
C023 0.001
R031 3.3k
R029 1.5k
C020 33p
L002 68µH
C011 2.2/6.3V
C026 0.047
C005 0.047
C002 2.2 6.3V
R003 100k
C001 0.047
C022 10 4V
Q002
R002 470k
R008 470k
R010 10k
R011 22k
R013 1M
1-619-920-
11
7
8
9
10
11
12

VD-5(COMB FILTER) SCHEMATIC DIAGRAM

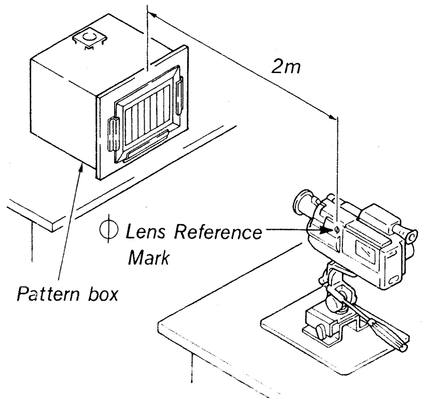

VD-5 BOARD
1 2 3 4 5 6 7 8 9 10 11
A B C D E F G H I
3.58M OUT2
3.58M OUT1
3.58M IN
YD ADJ
VA PB MODE
BURST P
COMB OUT C
COMB IN C
AGC OUT Y
PB Y
DROP OUT P
SP/LP
Y/C SEP
LPF
GND2
GND2
IC001
CX20031
COMB FILTER
H SYNC INSERT
LPF
CORR DET
AGC DET
AM DET
AM
CLAMP
Y COMB AGC
Q003
2SC1623
BUFFER
Q002
2SC3397
CORR DET SENS SW
D002
1S2835
FL002 Y LPF
FL001 Y DL
PEAK DET
10.7M OUT2
10.7M OUT1
10.7M IN
REG 5V1
GND1
10.7M
REG 5V2
YD
Y-YD
LIM OUT
SYNC SEP Y
MIX Y
EDIT
JOG
DUB AREA
HD INSERT
no mark : REC mode
( ) : PB mode

- **Signal path**
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ⇛ : REC Y/CHROMA Signal

Note:

- Caution when replacing tip parts.
  New parts must be attached after removal of tip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the head.
- All resistors are in ohms, 1/10W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ☐ : panel designation.
- ▭ : Nonflammable resistor
- —— : B+ bus.
- ☐ : adjustment for repair.
- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

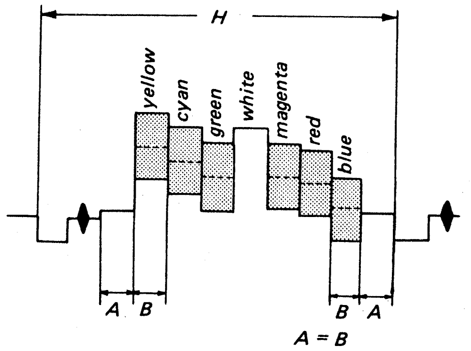

H
yellow
cyan
green
white
magenta
red
blue
A B
B A
A = B

Fig.a Camera output waveform of No.⑦ terminal of FP-81 flexible board.

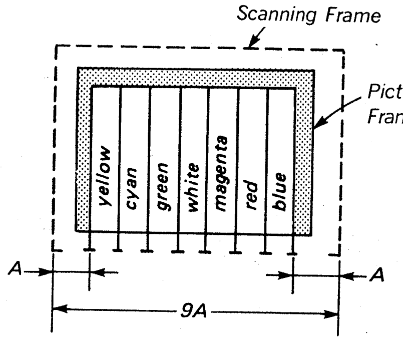
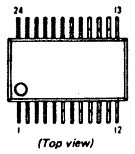

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

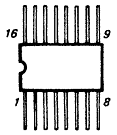
Fig. b Picture of TV monitor screen

4-3. SEMICONDUCTORS

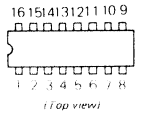
AN2510S


24
13
1
12
(Top view)

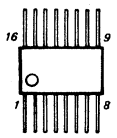
BA6303F
CX20115
CX22021
MC14526BF
TA7733F
TC4526BF
TC4538BF



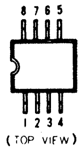
CXA1042M


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

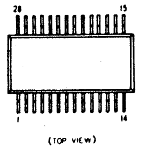
CXA1157M
TL1451ACNS
µPD6142G-101



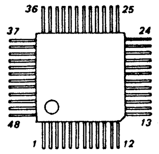
CXB0026M
TL062CPS
µPC393G2


8 7 6 5
1 2 3 4
(TOP VIEW)

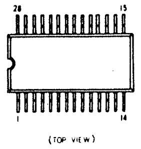
CXD1030M


28
15
1
14
(TOP VIEW)

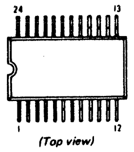
CX20030
CX20031
CX20032
CX20034
CX20037-A
CX20053
CX20055
CX20151
CX23054
CX23047B
MB673194U


36
25
37
24
48
13
1
12

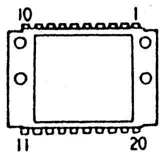
CX20035
CX20036
CX20039


28
15
1
14
(TOP VIEW)

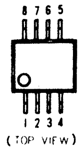
CX20114
CX20180


24
13
1
12
(Top view)

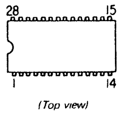
IU018K-AA
IU018CK-AA



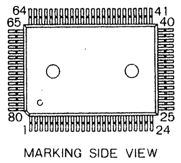
LA5005MTP
µPC4572G2
µPD4066BG


8 7 6 5
1 2 3 4
(TOP VIEW)

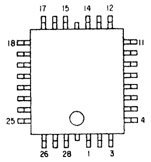
MB8464-12LLPF
MB8464-15LP


28
15
1
14
(Top view)

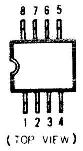
MB88551-258K


64
41
65
40
80
25
1
24
MARKING SIDE VIEW

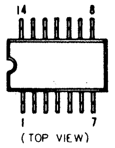
MC146805F2FP-SC82435


17 15 14 12
18
11
25
4
26 28 1 3

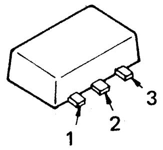
MMH0026D


8 7 6 5
1 2 3 4
(TOP VIEW)

NJM3403AM
TC4066BF
TC74H00F
µPC324G2

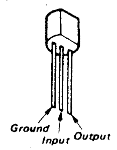

14
8
1
7
(TOP VIEW)

S-8052AL0-LG
S-8054ALB

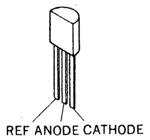


1. OUT
2. IN
3. GND

S-81250AG


Ground
Input
Output

TL431CLPB


REF ANODE CATHODE

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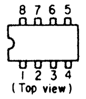
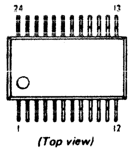

8 7 6 5
1 2 3 4
(Top view)

µPD6105G102


24
13
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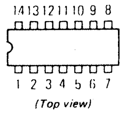
12
(Top view)

µPD74HC08G


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

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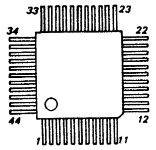
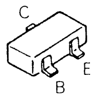

33
23
34
22
44
12
1
11

DTA114TK
DTA124EK
DTA143EK
DTA144EK
DTA144WK
DTC114EK
DTC124EK
DTC124XK
DTC144EK
DTC144TK
DTC144WK
2SA812
2SA1122
2SA1162
2SA1179
2SA1226
2SB624
2SB624-BV4
2SB815-B6
2SC1623
2SC1623-L7
2SC2412K
2SC2712
2SC2223
2SC2757
2SC2812L5
2SC3052
2SC3053-C



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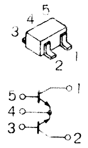
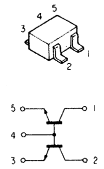

5
4
3
2
1
5
4
3
1
2

FMW2



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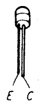
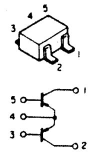


FMS-1



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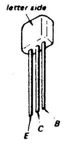
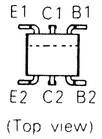
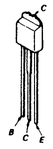

letter side
E C B

2SA1237


E1 C1 B1
E2 C2 B2
(Top view)

2SB1040A-5



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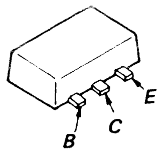

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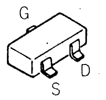
2SK303-TB
2SK209
2SK94



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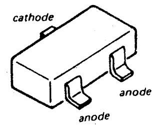
1S2837
WM151WK


cathode
anode
anode

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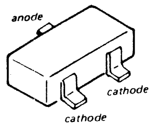
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cathode
cathode

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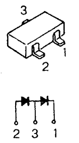
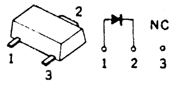
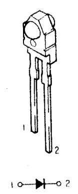
MA153
1SS123



E10QS03
E10QS04



GL452S



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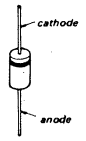
HZ5BLL
RD13EB2


cathode
anode

MA151WA
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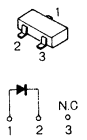
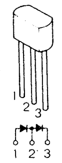
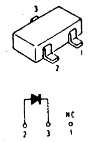
1SS222



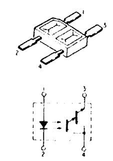
MC931



RD5.1M-B3
RD9.1M-B1
1SS193
1SS220



TLP907-0



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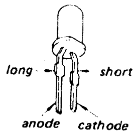
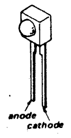
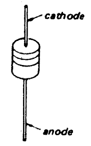
TLY124


long
short
anode
cathode

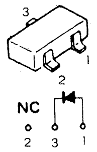
TLR223


anode
cathode

1SS119
1SS133
1SS148


cathode
anode

1SS196



SECTION 5
EXPLODED VIEWS

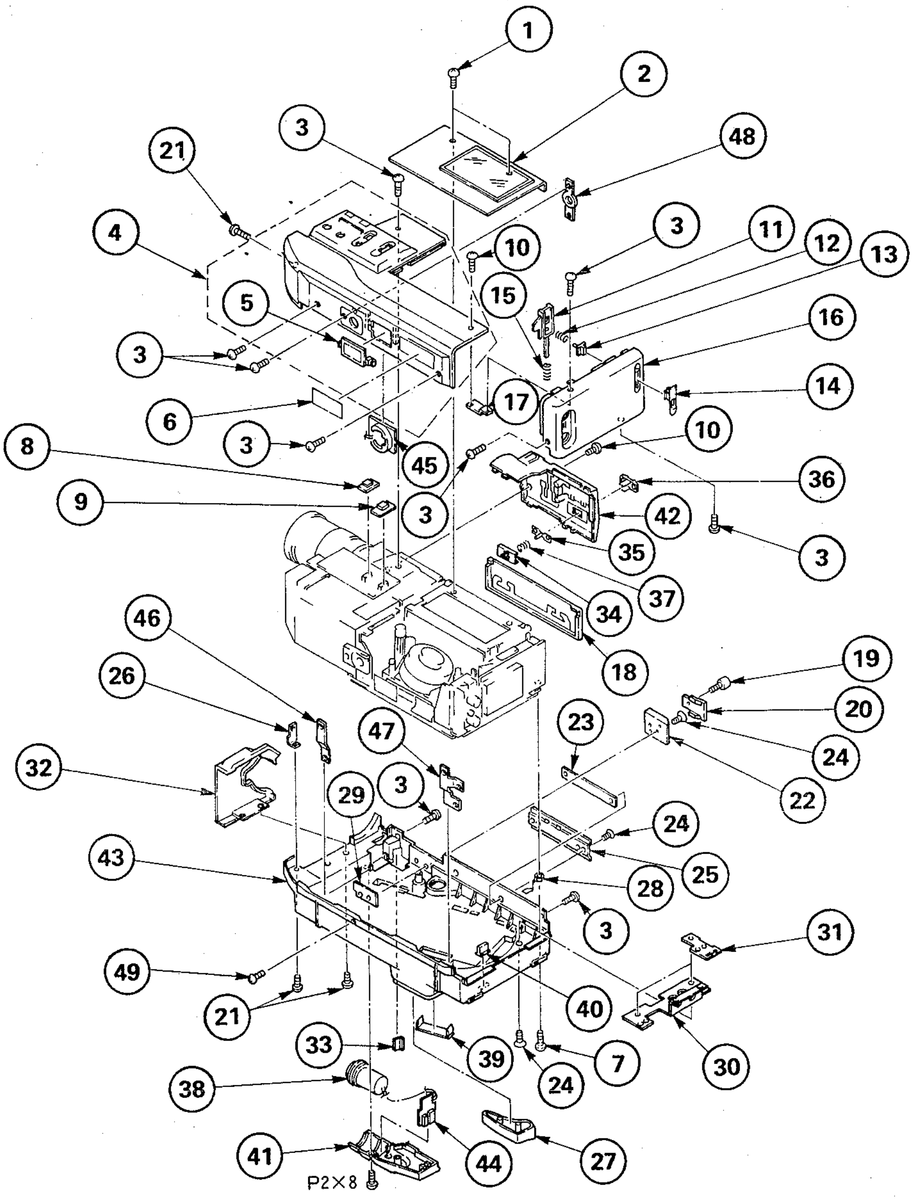
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

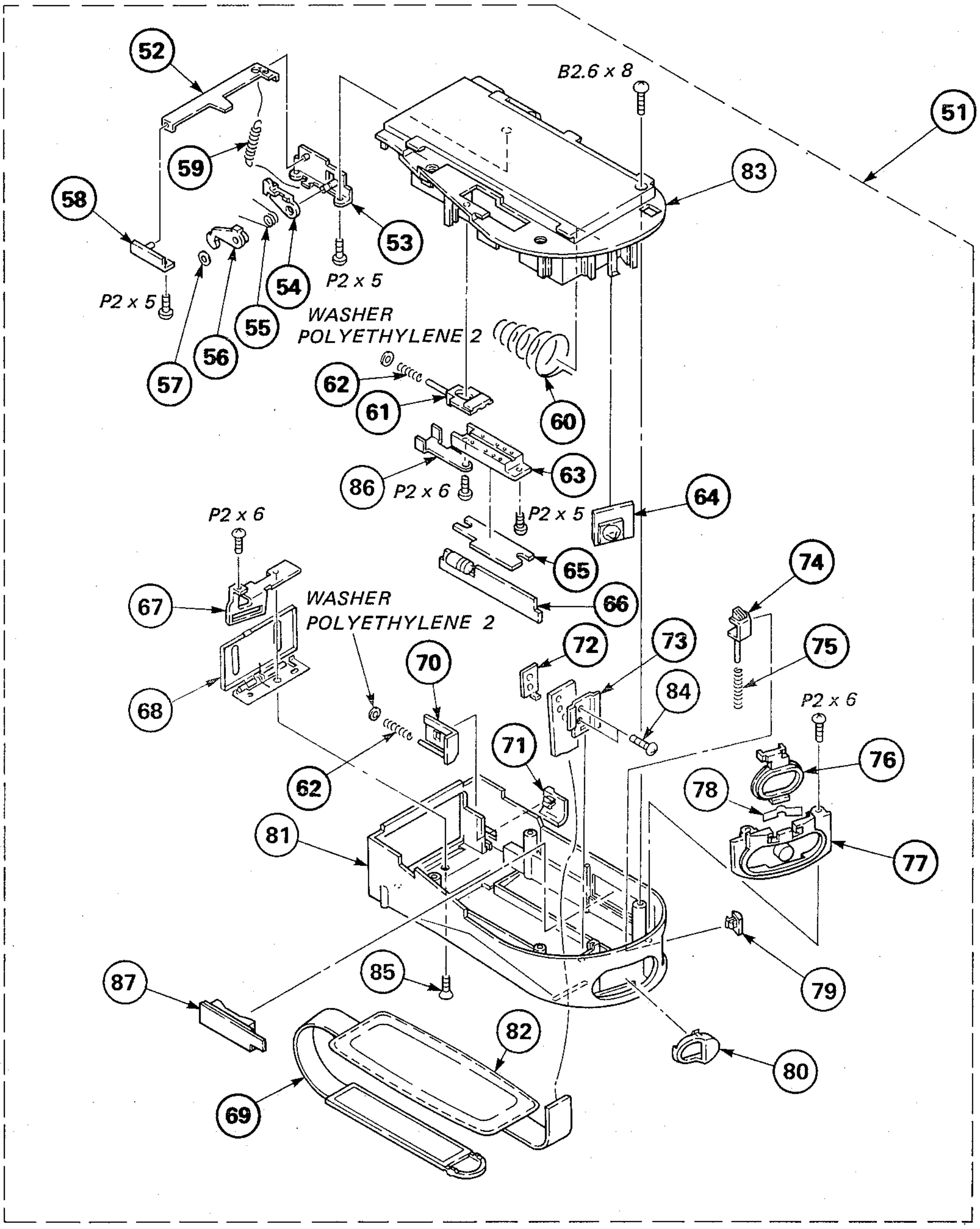
Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1. CABINET ASSEMBLY



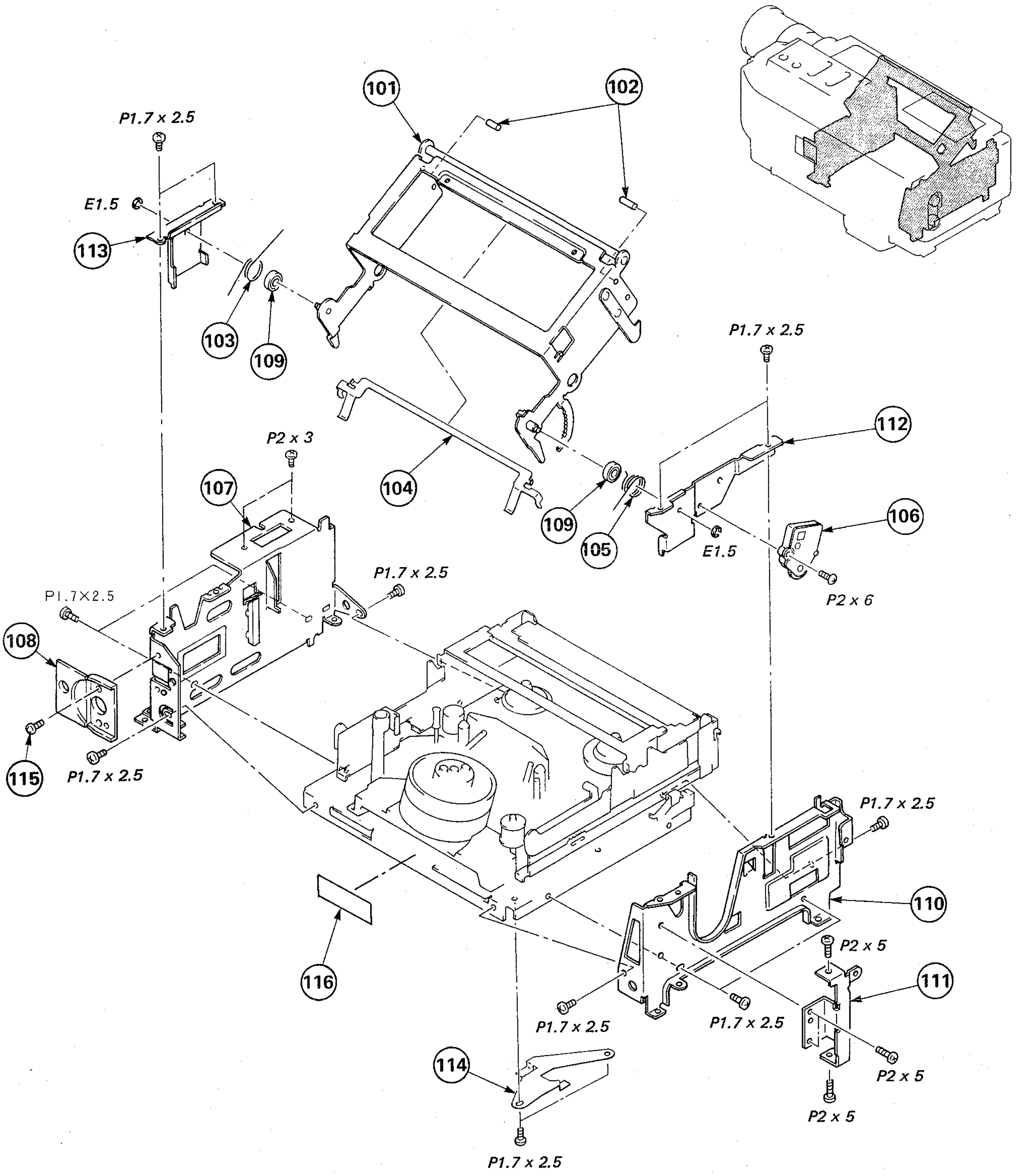
No.	Part No.	Description	Remark
1	3-713-791-01	SCREW (M1.7X5), TAPPING, P2	
2	X-3712-046-1	LID ASSY, LS CASSETTE	
3	3-713-792-01	SCREW (M2X10)	
4	X-3713-773-1	CABINET (RIGHT) ASSY	5
5	3-719-364-01	LID, BATTERY CASE, LITHIUM	
6	*3-719-386-01	LABEL, MODEL NUMBER (US/CND MODEL)	
	*3-719-383-01	LABEL, MODEL NUMBER (E MODEL)	
7	3-713-786-01	SCREW (M2X4)	
8	3-712-188-01	KNOB, AF	
9	3-712-187-01	KNOB, AWB	
10	3-713-786-31	SCREW (M2X6)	
11	3-713-747-01	KNOB (B), EJECT	
12	3-699-532-02	SPRING, COMPRESSION	
13	3-699-534-01	KNOB, LOCK	
14	3-699-537-01	KNOB, EJECT	
15	3-713-905-01	SPRING, COMPRESSION	
16	X-3713-704-1	PANEL ASSY, REAR	
17	3-712-193-01	JOINT, CABINET	
18	X-3712-170-1	LID ASSY, CASSETTE	
19	3-678-103-11	SCREW, EVF STOPPER	
20	3-688-940-01	SPRING, LEAF	
21	3-713-786-21	SCREW (M2X3)	
22	3-688-985-01	SHOE, ACCESSORY	
23	3-713-914-01	BRACKET, EVF SHOE	
24	3-713-788-01	SCREW (M2X5)	
25	3-713-782-01	RAIL, GUIDE	
26	*3-719-355-01	JOINT, CABINET (LEFT) (RIGHT)	
27	3-719-361-01	HAND REST	
28	*3-713-965-01	PLATE (C), GROUND	
29	3-713-715-01	BRACKET, SHOE	
30	3-713-774-01	JOINT, REAR	
31	3-713-713-01	BRACKET, STRAP	
32	X-3712-169-1	PANEL ASSY, FRONT	
33	3-719-352-01	WINDOW, AW SENSOR	
34	3-719-360-01	PLATE, LOCK	
35	3-719-359-01	BUTTON, LOCK	
36	3-718-226-01	BUTTON, POWER	
37	3-303-973-00	SPRING, COMPRESSION	
38	1-542-091-22	MICROPHONE, ELECTRET CONDENSER	
39	1-559-324-22	SOCKET (TERMINAL BOARD (B))	
40	3-713-714-01	KNOB, EDIT	
41	3-719-371-11	HOUSING, MICROPHONE	
42	X-3713-703-1	BOARD ASSY, FUNCTION	34-37
43	A-7080-392-A	CABINET (LEFT) BLOCK ASSY (US/CND MODEL)	19-31, 46, 47
	A-7080-424-A	CABINET (LEFT) BLOCK ASSY (E MODEL)	19-31, 46, 47
44	*1-620-826-13	MJ-12 BOARD	
45	*1-623-008-11	LI-3 BOARD	
46	*3-719-356-01	JOINT, LR	
47	*3-719-357-01	JOINT, LRR	
48	3-719-353-01	SCREW, TRIPOD	
49	3-719-381-01	SCREW (M2X4)	

5-2. GRIP ASSEMBLY


52
B2.6 x 8
51
83
59
58
53
54
P2 x 5
P2 x 5
55
WASHER
POLYETHYLENE 2
56
57
62
61
60
86
P2 x 6
63
P2 x 5
64
P2 x 6
65
67
WASHER
POLYETHYLENE 2
66
74
72
73
75
70
84
P2 x 6
68
71
76
62
78
81
77
79
87
85
82
80
69

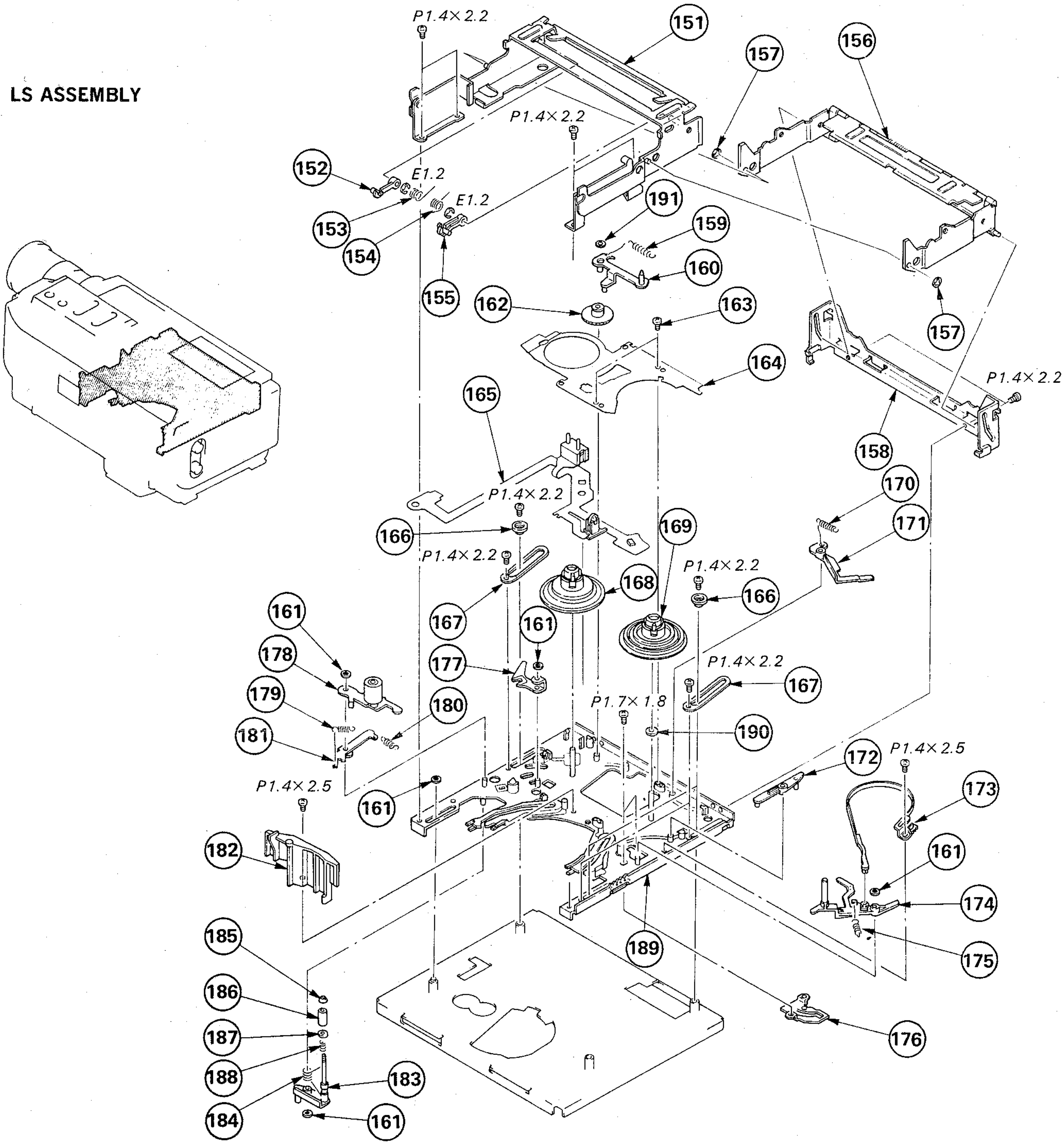
No.	Part No.	Description	Remark
51	A-7080-393-A	GRIP BLOCK ASSY	52-87
52	3-712-198-01	PLATE, LOCK, B	
53	X-3712-055-1	SUPPORT (UPPER) ASSY, B LOCK	
54	3-713-750-01	RETAINER, LOCK PLATE	
55	3-713-704-01	SPRING, TORSION	
56	3-713-751-01	LEVER, RELEASE, B	
57	3-321-813-11	WASHER, COTTER POLYETHYLENE	
58	X-3712-056-1	SUPPORT (LOWER) ASSY, B LOCK	
59	3-305-914-00	SPRING, TENSION	
60	3-713-935-01	SPRING	
61	3-713-708-01	COVER, TERMINAL	
62	3-564-951-00	SPRING, COMPRESSION	
63	1-566-607-11	PLUG (TERMINAL BOARD (A))	
64	*A-7070-475-A	RC-21 BOARD, COMPLETE	
65	*1-623-014-11	TA-50 BOARD	
66	*1-623-018-11	FH-14 BOARD	
67	3-712-516-01	BRACKET (B), BELT	
68	X-3712-010-1	LID ASSY, BATTERY	
69	3-713-796-01	BELT, GRIP	
70	3-713-703-01	CLAW, B RELEASE	
71	3-713-749-01	KNOB, B RELEASE	
72	3-713-711-01	BRACKET (C), BELT	
73	3-713-710-01	BRACKET (A), BELT	
74	3-713-707-01	LEVER, RELEASE, G	
75	3-465-047-00	SPRING, COMPRESSION	
76	3-713-753-01	HOLDER, PS KEY TOP	
77	X-3712-045-1	HOLDER ASSY, REC BUTTON	
78	3-713-709-01	SPRING	
79	3-713-706-01	KNOB, G RELEASE	
80	3-713-723-01	KEY TOP, PS	
81	X-3713-702-1	CABINET (L) ASSY, GRIP	
82	3-712-061-01	PAD, GRIP	
83	X-3712-164-1	CABINET (R) ASSY, GRIP	
84	3-699-401-01	SCREW (2X4), (+) (B)	
85	3-713-787-01	SCREW (M2X4)	
86	*3-713-938-01	RETAINER, TERMINAL COVER	
87	1-554-944-41	SWITCH, PUSH (ZOOM)	

5-3. CASSETTE ARM, FRAME ASSEMBLY


101
102
P1.7 x 2.5
E1.5
113
103
109
P1.7 x 2.5
112
P2 x 3
107
104
109
105
106
E1.5
P2 x 6
P1.7 x 2.5
P1.7X2.5
108
115
P1.7 x 2.5
P1.7 x 2.5
110
P2 x 5
116
111
P1.7 x 2.5
P1.7 x 2.5
114
P2 x 5
P2 x 5
P1.7 x 2.5

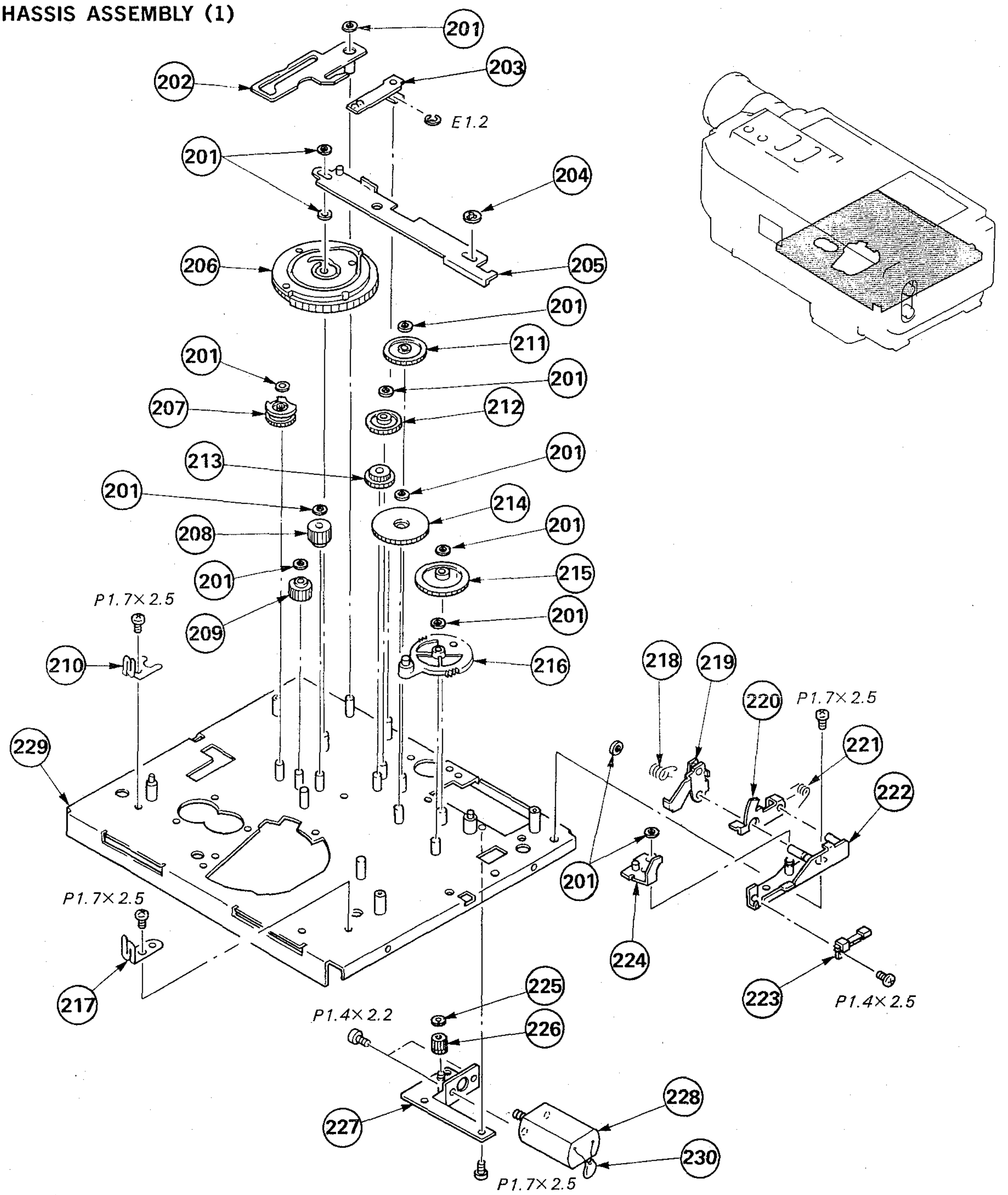
No.	Part No.	Description	Remark
101	X-3712-034-1	ARM ASSY (2), CASSETTE	102, 104
102	3-695-602-01	SHAFT, RIVETING, CASSETTE ARM	
103	3-695-582-01	SPRING, TORSION	
104	3-695-580-01	RETAINER, CASSETTE COMPARTMENT	
105	3-695-581-01	SPRING, TORSION	
106	3-681-528-11	DAMPER	
107	*X-3712-167-1	FRAME ASSY (3)	
108	3-719-358-01	COVER, TRIPOD SCREW	
109	3-695-512-02	COLLAR, CASSETTE ARM	
110	*X-3712-026-2	FRAME (B) ASSY (2)	
111	*3-712-197-01	BRACKET, JACK	
112	3-695-641-01	PLATE (S2), SIDE	
113	3-695-603-01	PLATE (T2), SIDE	
114	3-716-455-01	CLAMP, DH	
115	3-713-786-01	SCREW (M2X4)	
116	3-831-441-XX	CUSHION	

5-4. LS ASSEMBLY


P1.4×2.2
151
157
156
P1.4×2.2
152
E1.2
E1.2
153
154
155
191
159
160
162
163
157
164
P1.4×2.2
165
158
170
P1.4×2.2
171
166
169
P1.4×2.2
168
P1.4×2.2
166
161
167
161
178
177
P1.4×2.2
167
179
180
P1.7×1.8
181
190
172
P1.4×2.5
P1.4×2.5
173
161
182
161
174
175
185
189
186
176
187
188
183
184
161

No.	Part No.	Description	Remark
151	X-3695-447-4	COMPARTMENT ASSY, CASSETTE, LS	
152	3-695-595-01	RETAINER (T), CASSETTE	
153	3-695-605-01	SPRING, TORSION	
154	3-695-604-01	SPRING, TORSION	
155	3-695-594-01	RETAINER (S), CASSETTE	
156	X-3695-448-3	ARM ASSY, BLIND	
157	3-669-465-00	WASHER (1.5), STOPPER	
158	3-695-646-01	ARM, LS	
159	3-695-718-01	SPRING, TENSION	
160	X-3712-037-1	LEVER (A) ASSY (2)	
161	3-315-384-31	WASHER, STOPPER	
162	X-3712-025-1	GEAR ASSY, TS	
163	3-699-402-01	SCREW (M1.3X5.5), TAPPING	
164	3-712-165-01	PLATE (2), STOPPER	
165	A-7060-693-A	FP-53 BOARD, COMPLETE	
166	3-695-698-01	GUIDE, LS	
167	3-695-697-01	SPRING, LEAF, LS	
168	X-3695-436-1	TABLE ASSY, REEL, TAKE-UP	
169	X-3712-038-1	TABLE ASSY (2), REEL, SUPPLY	190
170	3-542-475-00	SPRING, TENSION	
171	3-712-151-01	BRAKE (2), SOFT	
172	3-695-735-01	ARM, TG1 RELEASE	
173	X-3695-432-1	BAND ASSY, TG1	
174	X-3712-019-1	ARM ASSY (2), TG1	
175	3-695-591-01	SPRING, TENSION	
176	3-695-733-01	PLATE, CAM, LS	
177	X-3712-022-1	ARM (B) ASSY (2), PINCH	
178	X-3712-032-2	ARM (C) ASSY (2), PINCH	
179	3-695-622-01	SPRING, TENSION	
180	3-695-719-01	SPRING, TENSION	
181	X-3695-415-1	PINCH LEVER ASSY	
182	3-695-624-01	BASE, PROTECT	
183	X-3712-027-1	ARM ASSY (2), TG7	
184	3-695-541-01	SPRING	
185	3-712-158-01	FLANGE, UPPER, TG7	
186	3-712-160-01	SLEEVE (2), TG7	
187	3-712-159-01	FLANGE, LOWER, TG7	
188	3-712-157-01	SPRING, COMPRESSION	
189	X-3712-035-1	CHASSIS ASSY (2), LS	
190	3-701-444-01	WASHER, 6	
191	3-321-393-01	WASHER, STOPPER	

5-5. CHASSIS ASSEMBLY (1)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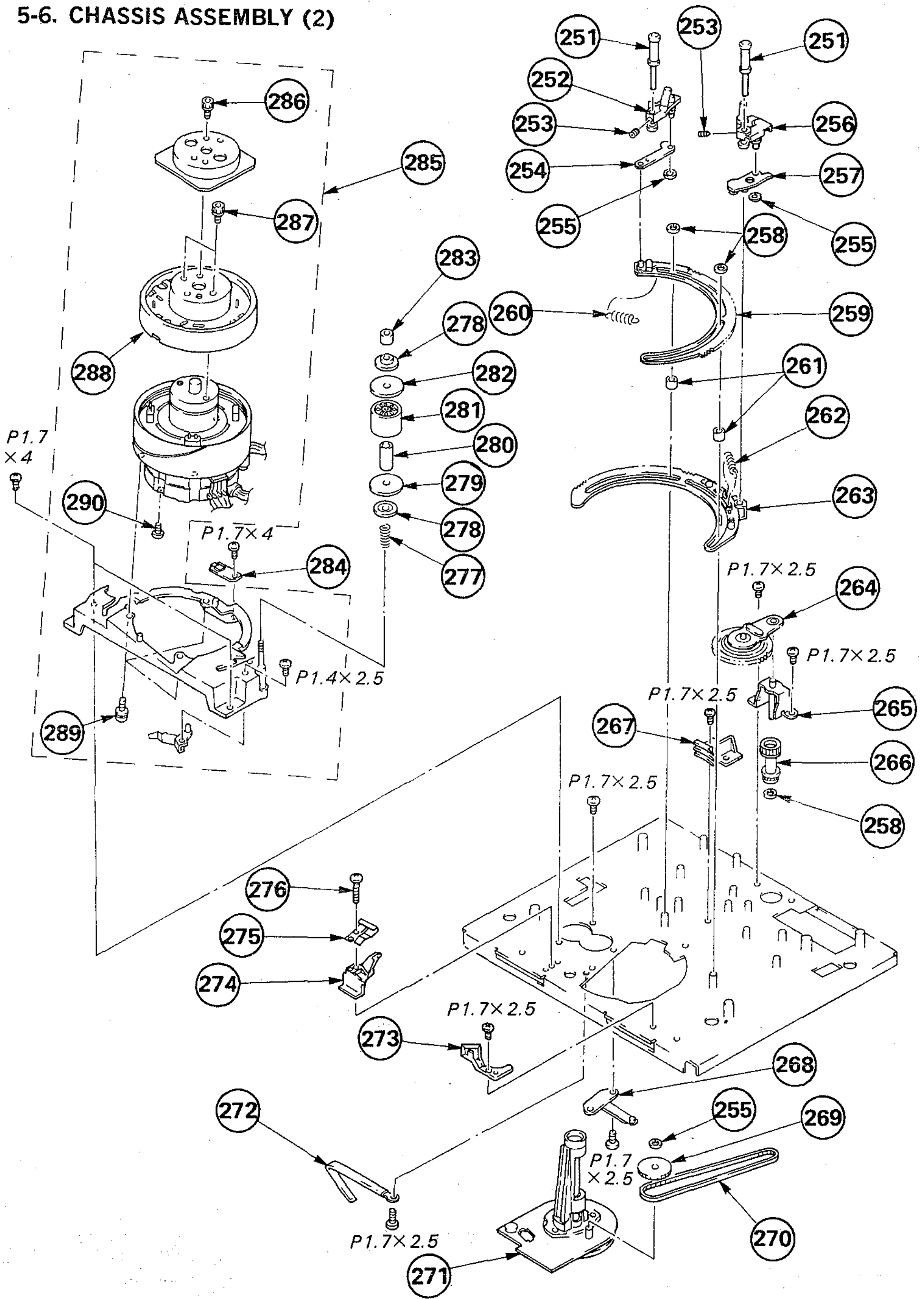
P1.4×2.5

No.	Part No.	Description	Remark
201	3-315-384-31	WASHER, STOPPER	
202	X-3712-023-1	ARM (A) ASSY (2), PINCH	
203	3-695-589-01	LEVER (B), REEL LOCK	
204	3-669-465-00	WASHER (1.5), STOPPER	
205	X-3695-439-1	SLIDER ASSY, M	
206	X-3712-031-1	CAM ASSY (2)	
207	3-712-156-01	GEAR (M) (2), THREADING	
208	3-695-537-01	GEAR (T), THREADING	
209	3-695-536-01	GEAR (S), THREADING	
210	*3-695-706-01	SPRING (T)	
211	3-695-559-01	GEAR (B), THREADING	
212	3-695-724-01	GEAR (D), THREADING	
213	3-712-162-02	GEAR (C) (2), THREADING	
214	3-695-714-01	GEAR (A), LS	
215	3-695-563-04	GEAR (B), LS	
216	X-3695-417-1	GEAR (C) ASSY, LS	
217	*3-695-705-01	SPRING (S)	
218	3-713-937-01	SPRING (A) (2)	
219	X-3695-418-1	ARM ASSY, LOCK	
220	3-695-574-01	ARM, RETURN PREVENTION	
221	3-695-579-01	SPRING (B), TORSION	
222	X-3712-018-1	BASE ASSY (2), LOCK	
223	1-553-226-00	SWITCH, LEAF (CCD SW) S902	
224	X-3695-438-1	ARM ASSY, EJECT	
225	3-321-393-01	WASHER, STOPPER	
226	3-712-150-01	WHEEL, WORM	
227	X-3712-017-1	HOLDER ASSY, MOTOR	
228	1-541-508-11	MOTOR, DC LA14-323F (LOADING) M903	
229	X-3712-036-1	CHASSIS ASSY (2), MECHANICAL	
230	1-161-013-00	CAP, CERAMIC 0.01MF	

5-6. CHASSIS ASSEMBLY (2)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P1.7
×2.5
P1.7×2.5
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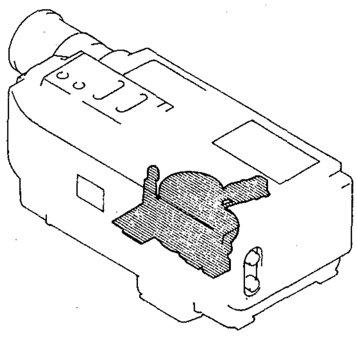
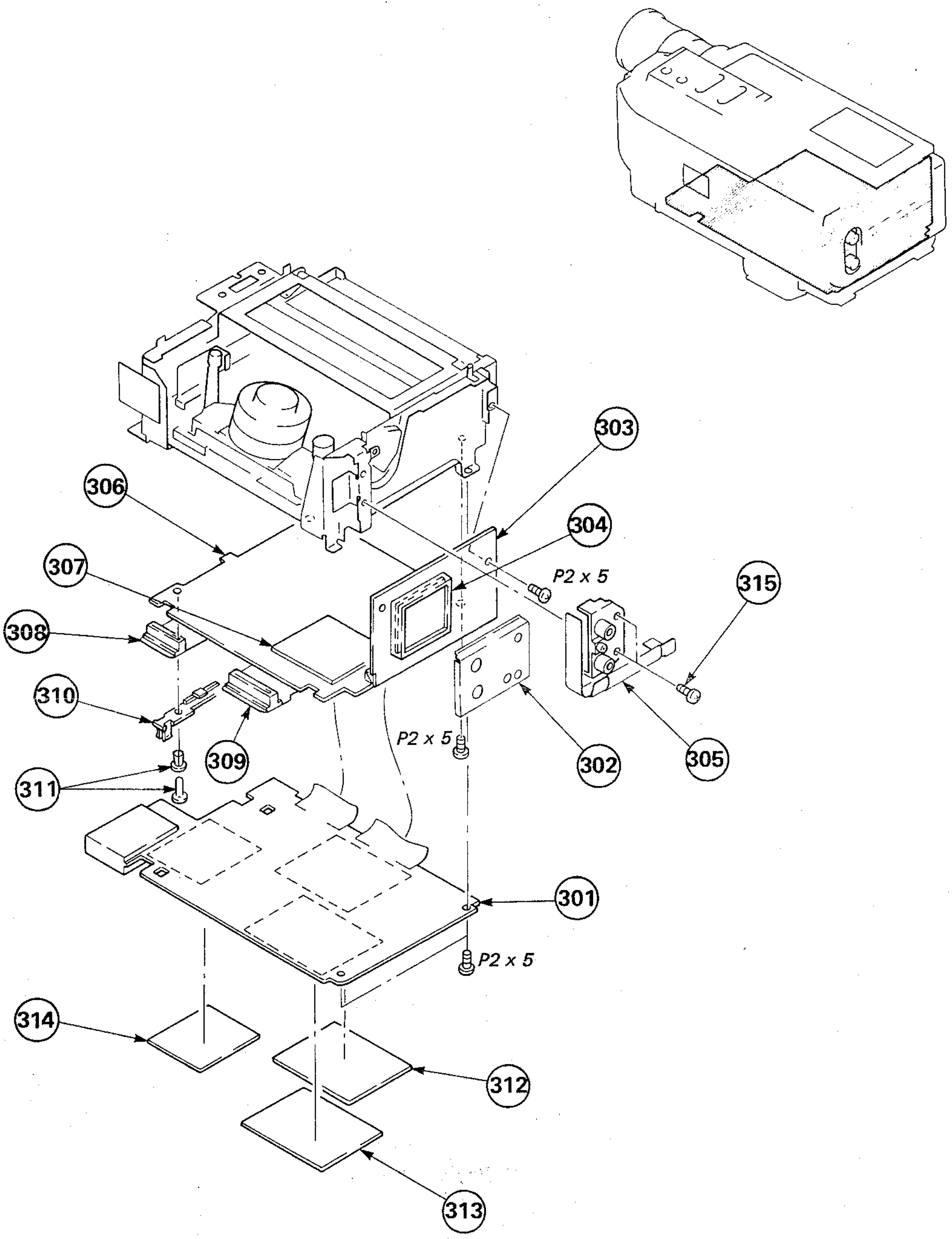


No.	Part No.	Description	Remark
251	X-3712-029-1	ROLLER ASSY (2), GUIDE	
252	X-3712-030-1	BASE ASSY (2), TG5	
253	3-695-770-01	SCREW, GR LOCK	
254	3-695-545-01	JOINT, T	
255	3-321-393-01	WASHER, STOPPER	
256	X-3712-028-1	BASE ASSY (2), TG4	
257	X-3695-429-1	JOINT ASSY, S	
258	3-315-384-31	WASHER, STOPPER	
259	X-3695-414-1	SLIDER (T) ASSY, THREADING	
260	3-695-773-01	SPRING, TENSION	
261	3-695-544-01	ROLLER, GUIDE	
262	3-695-772-01	SPRING, TENSION	
263	X-3695-428-1	SLIDER (S) ASSY, THREADING	
264	X-3712-024-1	ARM ASSY (2), GEAR	
265	X-3712-020-1	BASE ASSY (2), MIDWAY PULLEY	
266	X-3712-021-1	PULLEY ASSY (2), MIDWAY	
267	3-712-163-01	SUPPORT (2), SLIDER	
268	1-535-574-11	TERMINAL, SHAFT GROUND	
269	X-3695-413-1	GEAR ASSY, CHANGE	
270	3-695-637-01	BELT, RELAY	
271	8-835-223-01	MOTOR, DC BHF-3301B (CAPSTAN) M902	
272	3-712-161-01	CLAMP	
273	3-695-627-01	STOPPER, SLIDER, S	
274	3-695-628-01	STOPPER, SLIDER, T	
275	3-695-677-01	SPRING (T), LEAF	
276	3-695-519-01	SCREW, FITTING, LEAF SPRING(T)	
277	3-695-532-01	SPRING, COMPRESSION	
278	3-695-727-01	RETAINER, FLANGE, UPPER	
279	3-695-794-01	FLANGE, LOWER, TG2	
280	3-695-530-01	SLEEVE, TG2	
281	3-712-164-01	ROLLER (2), TG2	
282	3-695-528-01	FLANGE, TG2	
283	3-695-529-01	NUT, TG2	
284	1-807-238-11	SENSOR, DEW CONDENSATION	
285	A-7048-081-A	DRUM ASSY (DGU-19A-R)	286-290
286	3-686-422-01	WASHER (2X2.7), BOLT, HOLE	
287	3-686-403-01	SCREW (2X5), BOLT WASHER	
288	A-7049-107-A	DRUM ASSY, UPPER (DGR-19-R)	
289	3-686-444-02	SCREW +P 2X5.5	
290	3-686-458-01	SCREW (P1.4X2.5), TAPPING	

5-7. MAIN BOARD ASSEMBLY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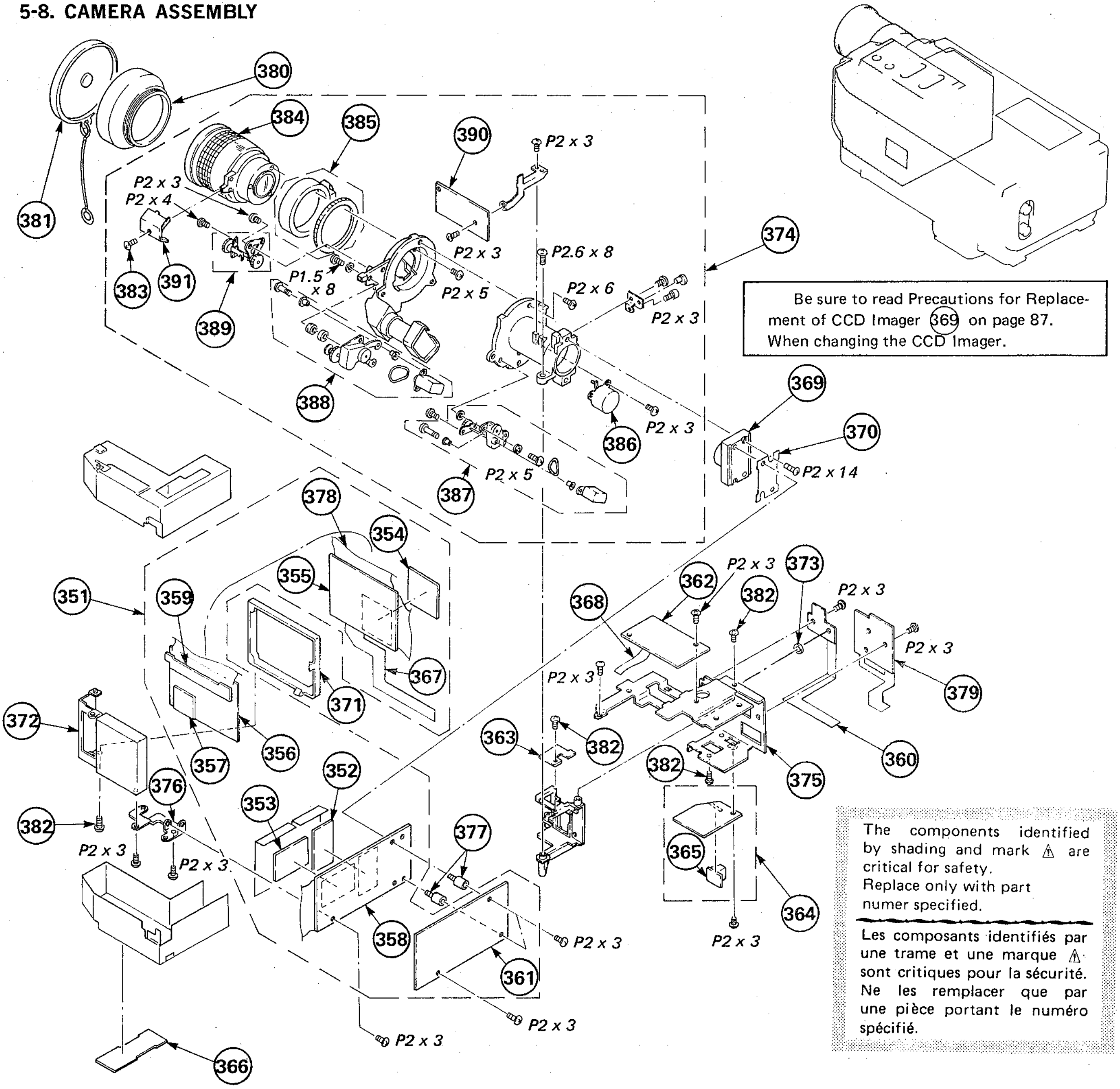
No.	Part No.	Description	Remark
301	*A-7060-831-A	MV-11 BOARD, COMPLETE	312-314
302	*3-713-990-01	CASE (UPPER), SHIELD, RP	
303	*A-7060-688-A	MR-8 BOARD, COMPLETE	304
304	A-7068-043-A	RP-34 BOARD, COMPLETE (HIC)	
305	1-620-629-11	FP-49 FLEXIBLE BOARD	
306	*A-7060-686-A	SS-70 BOARD, COMPLETE	307-309
307	*A-7060-687-A	AU-31 BOARD, COMPLETE	
308	A-7090-594-A	CONNECTOR BLOCK ASSY (A)	
309	A-7090-595-A	CONNECTOR BLOCK ASSY (B)	
310	3-713-761-01	HOLDER, MV PC BOARD	
311	3-531-576-11	RIVET	
312	A-7068-055-A	VC-10 BOARD, COMPLETE (HIC)	
313	A-7068-058-B	VY-8 BOARD, COMPLETE (HIC)	
314	A-7068-059-B	VD-5 BOARD, COMPLETE (HIC)	
315	3-686-999-41	SCREW (2.6X5) (C LOCK), (+) B	

5-8. CAMERA ASSEMBLY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P2.6 x 8
P2 x 6
P2 x 3
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P2 x 3
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P2 x 14
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P2 x 5
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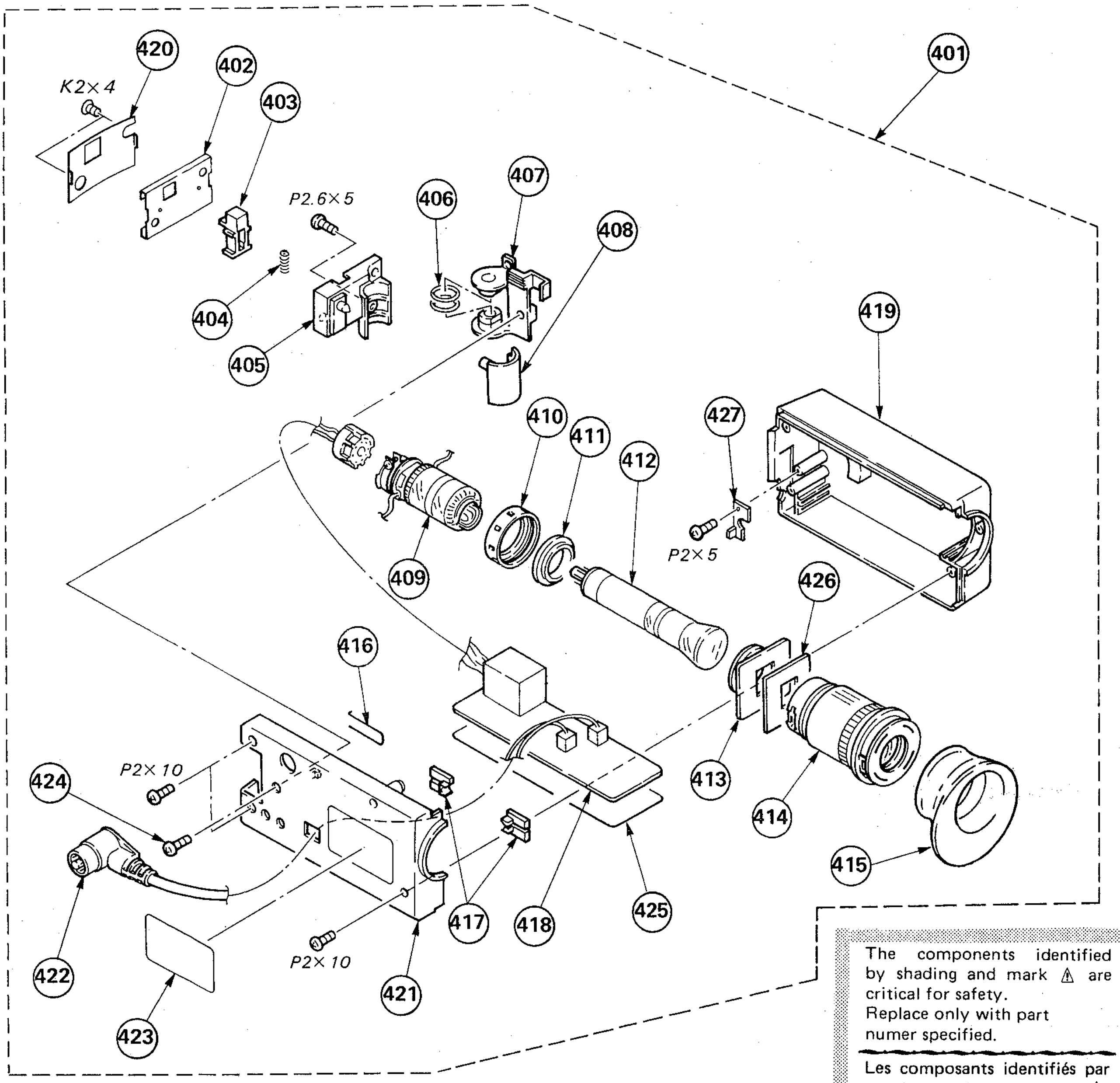
Be sure to read Precautions for Replacement of CCD Imager ㊿369 on page 87.
When changing the CCD Imager.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
351	*A-7030-068-A	CAMERA BOARD ASSY	352-368, 378
352	A-7068-056-A	DT-61 BOARD, COMPLETE (HIC)	
353	*A-7068-088-A	SH-2 BOARD, COMPLETE	
354	A-7060-835-A	MX-2 BOARD, COMPLETE	
355	*A-7060-834-A	VC-21 BOARD, COMPLETE	354
356	*A-7060-836-A	VC-22 BOARD, COMPLETE	357, 359
357	*A-7060-888-A	IA-1 (B) BOARD, COMPLETE	
358	*A-7060-839-A	VC-20 BOARD, COMPLETE	352, 353
359	*A-7070-467-A	CN-27 BOARD, COMPLETE	
360	A-7070-469-A	SK-21 BOARD, COMPLETE	
361	*A-7060-890-A	DS-24 BOARD, COMPLETE	
362	*1-623-009-11	SW-71 BOARD	
363	*A-7070-481-A	MA-21 BOARD, COMPLETE	
364	*A-7085-004-A	AW-AS BOARD, COMPLETE	365
365	*1-623-016-11	AS-20 BOARD	
366	*A-7070-468-A	RZ-1 BOARD, COMPLETE	
367	1-623-013-11	FP-81 FLEXIBLE BOARD	
368	1-623-019-11	FP-82 FLEXIBLE BOARD	
369	8-750-010-31	IU018CK-AA	
370	*3-690-235-01	SHEET, INSULATING, CCD	
371	*3-713-726-01	HOLDER (UPPER), VC PC BOARD	
372	⚠1-464-824-11	CONVERTER UNIT, DC/DC	
373	3-719-810-01	WASHER	
374	1-547-242-11	LENS, ZOOM (VCL-1206YH)	383-391
375	X-3712-179-1	FRAME ASSY, LENS FITTING	373
376	*3-719-351-01	BRACKET, VC PC BOARD	
377	*3-719-362-01	SPACER, DS PC BOARD FITTING	
378	1-623-012-11	FP-80 FLEXIBLE BOARD	
379	1-623-007-11	SK-19 FLEXIBLE BOARD	
380	3-718-235-01	HOOD, LENS	
381	3-719-348-01	CAP, HOOD	
382	3-713-790-01	SCREW (M2X5), TAPPING, P3	
383	3-719-845-01	SCREW, B 2X4 TAPPING	
384	3-707-368-01	ROLLET RUBBER, FOCUS	
385	3-707-371-01	RING ASSY, ZOOM	
386	3-707-369-01	METOR ASSY, EE M904	
387	1-541-537-11	MOTOR ASSY, ZOOM M906	
388	1-541-536-11	MOTOR ASSY, AF M905	
389	3-707-370-01	GEAR ASSY, AF DRIVE	
390	A-7060-961-A	AF-32 BOARD, COMPLETE	
391	3-719-687-01	COVER, MOTOR GEAR	

5-9. EVF ASSEMBLY



The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
401	A-7019-046-A	EVF ASSY (U/C MODEL)	402-427
402	3-713-550-01	LINING, EVF	
403	3-713-742-01	BUTTON, LOCK	
404	3-480-102-00	SPRING, COMPRESSION	
405	X-3686-905-1	HINGE (A) ASSY, EVF	
406	3-146-316-21	RING, RUBBER	
407	3-713-741-01	BASE, HINGE	
408	3-713-556-01	HINGE (B), EVF	
409	⚠1-451-296-21	DEFLECTION YOKE(BLACK & WHITE) L901	
410	3-713-534-01	RETAINER, CRT	
411	*3-712-660-01	RING, RUBBER	
412	⚠1-546-061-11	CATHODE-RAY TUBE, B/W V901	
413	3-712-183-01	COVER, CRT	
414	A-7080-263-A	FINDER BLOCK ASSY	
415	3-713-548-01	CUP, EYE	
416	3-713-533-01	SHAFT, HINGE LOCK	
417	3-712-184-01	RETAINER, CORD	
418	*A-7060-738-A	VF-8 (A) BOARD, COMPLETE	427
419	X-3712-052-1	CABINET (UPPER) ASSY, EVF	
420	3-713-781-01	LINING, SPRING	
421	X-3712-053-2	CABINET (LOWER) ASSY, EVF	
422	1-556-824-61	CORD, CONNECTION (WITH PLUG)8P	
423	*3-713-517-01	LABEL, MODEL NUMBER (U/C), EVF	
424	3-713-559-01	SCREW (2X6)	
425	*3-714-005-01	SHEET, INSULATING	
426	3-713-985-01	PLATE, CRT	
427	*1-620-623-14	LD-5 (A) BOARD	

5-10. HARDWEAR LIST

SCREW

7-621-255-45	SCREW +P 2X6
7-621-255-85	SCREW +P 2X14
7-621-284-10	SCREW +P 2.6X5
7-621-591-00	SCREW +K 2X4
7-627-553-67	SCREW, PRECISION +P 2X5
7-627-850-17	SCREW, PRECISION +P 1.4X2.5
7-627-552-07	SCREW, PRECISION +P 1.7X2.5
7-627-852-18	SCREW, PRECISION +P 1.7X4 TYPE3
7-627-852-38	SCREW, PRECISION +P1.7X1.8TYPE3
7-627-853-58	SCREW, PRECISION +P 2X5 TYPE3
7-685-103-19	SCREW +P 2X5 TYPE2 NON-SLIT
7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
7-685-106-19	SCREW +P 2X10 TYPE2 NON-SLIT
7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S
7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3

NUT

7-622-205-05	NUT M2 TYPE2

WASHER

7-623-922-01	WASHER 2.0, NYLONE

STOP RING

7-624-101-01	STOP RING 1.2 (E TYPE)
7-624-102-04	STOP RING 1.5, TYPE -E

SECTION 6
ELECTRICAL PARTS LIST

MV-11 **VC-10** **VY-8** **VD-5**

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

Ref.No	Part No.	Description	Remark
	*A-7060-831-A	MV-11 BOARD, COMPLETE **********************	
	A-7068-055-A	VC-10 BOARD, COMPLETE (HIC)	
	A-7068-058-B	VY-8 BOARD, COMPLETE (HIC)	
	A-7068-059-B	VD-5 BOARD, COMPLETE (HIC)	
	1-558-895-11	WIRE, FLAT TYPE 18P	
	1-558-896-11	WIRE, FLAT TYPE 22P	
	1-562-879-11	CONNECTOR, CARD EDGE 19P	
	1-562-880-11	CONNECTOR, CARD EDGE 15P	

CAPACITOR

Ref.No	Part No.	Description			Remark
C201	1-124-224-00	ELECT	47MF	20%	6.3V
C202	1-124-224-00	ELECT	47MF	20%	6.3V
C203	1-124-245-00	ELECT	4.7MF	20%	16V
C204	1-124-224-00	ELECT	47MF	20%	6.3V
C205	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C206	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C207	1-124-224-00	ELECT	47MF	20%	6.3V
C208	1-124-222-00	ELECT	22MF	20%	6.3V
C209	1-124-222-00	ELECT	22MF	20%	6.3V
C210	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C211	1-163-108-00	CERAMIC CHIP	43PF	5%	50V
C212	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C213	1-163-986-00	CERAMIC CHIP	0.027MF	10%	25V
C214	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C215	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C216	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C217	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C218	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C219	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C220	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C221	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C222	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C223	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C224	1-124-224-00	ELECT	47MF	20%	6.3V
C225	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C226	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C227	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C228	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C229	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C230	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C231	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C232	1-124-587-11	ELECT	220MF	20%	6.3V
C233	1-123-617-00	ELECT	10MF	20%	16V
C234	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C235	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C236	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C237	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C238	1-163-145-00	CERAMIC CHIP	0.0015MF	5%	50V
C239	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C240	1-123-617-00	ELECT	10MF	20%	16V
C241	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C242	1-124-225-00	ELECT	100MF	20%	6.3V
C243	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C244	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C245	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C246	1-124-224-00	ELECT	47MF	20%	6.3V
C247	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C248	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C249	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C251	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C253	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C254	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C255	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C256	1-161-023-00	CERAMIC	0.068MF	10%	50V
C257	1-161-023-00	CERAMIC	0.068MF	10%	50V
C651	1-124-236-00	ELECT	47MF	20%	16V
C652	1-127-496-00	ELECT(SOLID)	6.8MF	20%	16V
C653	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C654	1-127-489-00	ELECT(SOLID)	10MF	20%	10V
C655	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C656	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C657	1-127-487-00	ELECT(SOLID)	4.7MF	20%	10V
C658	1-127-504-00	ELECT(SOLID)	0.47MF	20%	25V
C659	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C660	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C661	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C662	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V
C664	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C665	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C666	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V

CONNECTOR

Ref.No	Part No.	Description	Remark
CN203	*1-563-584-11	CONNECTOR, FLEXIBLE 7P	
CN204	*1-563-609-11	CONNECTOR, FLEXIBLE 6P	
CN205	*1-564-017-00	PIN, CONNECTOR 7P	
CN206	*1-564-013-00	PIN, CONNECTOR 3P	
CN207	1-562-183-00	SOCKET 8P	
CN208	*1-564-008-00	PIN, CONNECTOR 9P	

TRIMMER

Ref.No	Part No.	Description	Remark
CV201	1-141-331-11	CAP, VAR, TRIMMER (CHIP)	

DIODE

Ref.No	Part No.	Description	Remark
D202	8-719-101-23	DIODE 1SS123	
D203	8-719-106-44	DIODE RD9.1M-T1B2	
D204	8-719-106-44	DIODE RD9.1M-T1B2	
D205	8-719-106-44	DIODE RD9.1M-T1B2	
D206	8-719-106-44	DIODE RD9.1M-T1B2	
D207	8-719-106-44	DIODE RD9.1M-T1B2	
D208	8-719-106-46	DIODE RD9.1M-T1B1	
D209	8-719-106-46	DIODE RD9.1M-T1B1	
D651	8-719-200-36	DIODE E10QS04	

When indicating parts by reference number, please include the board name.

MV-11

DELAY LINE

Ref.No	Part No.	Description	Remark
DL201	1-415-375-32	DELAY LINE, DUAL-1H	

IC

Ref.No	Part No.	Description	Remark
IC204	8-759-107-89	IC UPD6105G-102	
IC651⚠	8-759-937-36	IC TL1451ACNS	

COIL

Ref.No	Part No.	Description	Remark
L201	1-407-169-XX	MICRO INDUCTOR 100UH	
L202	1-407-169-XX	MICRO INDUCTOR 100UH	
L203	1-407-189-XX	MICRO INDUCTOR 15UH	
L204	1-407-169-XX	MICRO INDUCTOR 100UH	
L205	1-407-169-XX	MICRO INDUCTOR 100UH	
L206	1-408-969-21	MICRO INDUCTOR 8.2UH	
L207	1-407-177-XX	MICRO INDUCTOR 470UH	
L208	1-408-987-21	MICRO INDUCTOR 330UH	
L209	1-407-172-XX	MICRO INDUCTOR 180UH	
L210	1-407-163-XX	MICRO INDUCTOR 33UH	
L211	1-407-169-XX	MICRO INDUCTOR 100UH	
L212	1-407-169-XX	MICRO INDUCTOR 100UH	
L213	1-408-970-21	MICRO INDUCTOR 10UH	
L214	1-407-166-XX	MICRO INDUCTOR 56UH	
L215	1-408-970-21	MICRO INDUCTOR 10UH	
L216	1-408-960-21	MICRO INDUCTOR 1.5UH	
L217	1-408-960-21	MICRO INDUCTOR 1.5UH	
L651	1-421-918-11	COIL, CHOKE 10UH	
L652	1-410-690-11	COIL, CHOKE 22UH	
L653	1-408-773-31	INDUCTOR CHIP 4.7UH	
L654	1-408-788-21	INDUCTOR CHIP 82UH	
L655	1-408-785-21	INDUCTOR CHIP 47UH	
L656	1-408-777-00	INDUCTOR CHIP 10UH	

VARIABLE COIL

Ref.No	Part No.	Description	Remark
LV201	1-459-547-11	COIL, VARIABLE 15UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q201	8-729-901-06	TRANSISTOR DTA144EK	
Q202	8-729-901-01	TRANSISTOR DTC144EK	
Q203	8-729-901-01	TRANSISTOR DTC144EK	
Q206	8-729-901-01	TRANSISTOR DTC144EK	
Q207	8-729-901-01	TRANSISTOR DTC144EK	
Q208	8-729-312-22	TRANSISTOR 2SA1122C	
Q209	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q210	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q211	8-729-901-06	TRANSISTOR DTA144EK	
Q212	8-729-601-58	TRANSISTOR 2SC3053	
Q213	8-729-601-58	TRANSISTOR 2SC3053	
Q214⚠	8-729-601-58	TRANSISTOR 2SC3053	
Q215	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q216	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q217	8-729-900-53	TRANSISTOR DTC114EK	
Q218	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q219	8-729-312-22	TRANSISTOR 2SA1122C	
Q220	8-729-901-01	TRANSISTOR DTC144EK	
Q221	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q222	8-729-312-22	TRANSISTOR 2SA1122C	
Q223	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q224	8-729-901-06	TRANSISTOR DTA144EK	
Q227	8-729-901-01	TRANSISTOR DTC144EK	
Q652	8-729-901-05	TRANSISTOR DTA124EK	
Q653	8-729-805-25	TRANSISTOR 2SB1121	
Q654	8-729-901-00	TRANSISTOR DTC124EK	

RESISTOR

Ref.No	Part No.	Description				Remark
R201	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R203	1-216-035-00	METAL CHIP	270	5%	1/10W	
R204	1-216-045-00	METAL CHIP	680	5%	1/10W	
R205	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R206	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R207	1-216-043-00	METAL CHIP	560	5%	1/10W	
R208	1-216-035-00	METAL CHIP	270	5%	1/10W	
R209	1-216-035-00	METAL CHIP	270	5%	1/10W	
R210	1-216-029-00	METAL CHIP	150	5%	1/10W	
R211	1-216-019-00	METAL CHIP	56	5%	1/10W	
R212	1-216-025-00	METAL CHIP	100	5%	1/10W	
R214	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R215	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R216	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R217	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R218	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R219	1-216-041-00	METAL CHIP	470	5%	1/10W	
R220	1-216-025-00	METAL CHIP	100	5%	1/10W	
R221	1-216-033-00	METAL CHIP	220	5%	1/10W	
R222	1-216-033-00	METAL CHIP	220	5%	1/10W	
R223	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R224	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R225	1-216-043-00	METAL CHIP	560	5%	1/10W	
R226	1-216-037-00	METAL CHIP	330	5%	1/10W	
R227	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R228	1-216-047-00	METAL CHIP	820	5%	1/10W	
R229	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R230	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R231	1-216-041-00	METAL CHIP	470	5%	1/10W	
R232	1-216-021-00	METAL CHIP	68	5%	1/10W	
R233	1-216-043-00	METAL CHIP	560	5%	1/10W	
R234	1-216-045-00	METAL CHIP	680	5%	1/10W	
R235	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R236	1-216-043-00	METAL CHIP	560	5%	1/10W	
R237	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R238	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R239	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R240	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R241	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R242	1-216-049-00	METAL CHIP	1K	5%	1/10W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R243	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R244	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R245	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R246	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R247	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R248	1-216-039-00	METAL CHIP	390	5%	1/10W	
R249	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R250	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R251	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R252	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R253	1-216-021-00	METAL CHIP	68	5%	1/10W	
R254	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R255	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R256	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R257	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R258	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R259	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R260	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R261	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R262	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R263	1-216-047-00	METAL CHIP	820	5%	1/10W	
R264	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R265	1-216-017-00	METAL CHIP	47	5%	1/10W	
R266	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R267	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R268	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R269	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R270	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R271	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R272	1-216-039-00	METAL CHIP	390	5%	1/10W	
R273	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R274	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R275	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R276	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R277	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	
R278	1-216-138-00	METAL CHIP	3.3	5%	1/8W	
R279	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R280	1-216-295-00	METAL CHIP	0	5%	1/10W	
R282	1-216-047-00	METAL CHIP	820	5%	1/10W	
R283	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R285	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R287	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R288	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	

VARIABLE RESISTOR

RV203	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K
RV651	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K
RV652	1-230-867-11	RES, ADJ, METAL GLAZE 1K

SWITCH

S201	1-553-977-00	SWITCH, SLIDE (EDIT)

Ref.No	Part No.	Description	Remark
		TRANSFORMER	
T201	1-409-386-11	C E TRAP	
		CRYSTAL	
X201	1-567-303-11	VIBRATOR, CERAMIC	

****

*A-7060-686-A SS-70 BOARD, COMPLETE (AU-31 BOARD)
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	*3-674-372-00	HOLDER (A), LED
	3-713-725-01	HOLDER, TOP END SENSOR

CAPACITOR

C301	1-216-296-00	METAL CHIP	0	5%	1/8W
C302	1-162-638-11	CERAMIC CHIP	1MF		16V
C303	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C304	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C305	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C306	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C307	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C308	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C309	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C310	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C313	1-123-616-00	ELECT	4.7MF	20%	25V
C314	1-123-617-00	ELECT	10MF	20%	16V
C315	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C316	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C317	1-135-099-00	TANTAL. CHIP	2.2MF	10%	6.3V
C318	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C319	1-135-104-00	TANTAL. CHIP	10MF	10%	4V
C320	1-135-104-00	TANTAL. CHIP	10MF	10%	4V
C321	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C322	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C323	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C324	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C325	1-135-100-21	TANTAL. CHIP	6.8MF	10%	6.3V
C326	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C327	1-162-638-11	CERAMIC CHIP	1MF		16V
C328	1-216-296-00	METAL CHIP	0	5%	1/8W
C329	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C501	1-123-612-00	ELECT	2.2MF	20%	50V
C502	1-123-611-00	ELECT	1MF	20%	50V
C503	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C504	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C505	1-163-020-00	CERAMIC CHIP	0.0082MF	10%	50V
C506	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C507	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C508	1-124-577-11	ELECT	82MF	20%	10V
C509	1-163-209-00	CERAMIC CHIP	0.0015MF	5%	50V
C510	1-163-209-00	CERAMIC CHIP	0.0015MF	5%	50V
C511	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description			Remark
C512	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C513	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C514	1-124-499-11	ELECT	1MF	20%	50V
C515	1-124-287-00	ELECT	10MF	20%	10V
C516	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C517	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C518	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C519	1-124-287-00	ELECT	10MF	20%	10V
C520	1-163-211-00	CERAMIC CHIP	0.0018MF	5%	50V
C521	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C522	1-123-617-00	ELECT	10MF	20%	16V
C523	1-124-499-11	ELECT	1MF	20%	50V
C524	1-163-059-00	CERAMIC CHIP	0.01MF	10%	50V
C525	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C526	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C527	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C528	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C529	1-124-638-11	ELECT	22MF	20%	10V
C530	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C531	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C532	1-163-145-00	CERAMIC CHIP	0.0015MF	5%	50V
C533	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C534	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C535	1-127-487-00	ELECT(SOLID)	4.7MF	20%	10V
C536	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C538	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C539	1-124-255-00	ELECT	1MF	20%	50V
C540	1-124-255-00	ELECT	1MF	20%	50V
C541	1-124-255-00	ELECT	1MF	20%	50V
C542	1-124-258-00	ELECT	3.3MF	20%	25V
C543	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C544	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C545	1-124-462-00	ELECT	10MF	20%	16V
C546	1-124-462-00	ELECT	10MF	20%	16V
C547	1-124-462-00	ELECT	10MF	20%	16V
C548	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C549	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C550	1-127-506-00	ELECT(SOLID)	1MF	20%	25V
C551	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C553	1-126-099-11	ELECT	2.2MF	20%	35V
C554	1-124-236-00	ELECT	47MF	20%	16V
C556	1-126-099-11	ELECT	2.2MF	20%	35V
C557	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C558	1-124-596-11	ELECT	27MF	20%	16V
C559	1-124-596-11	ELECT	27MF	20%	16V
C560	1-124-596-11	ELECT	27MF	20%	16V
C561	1-123-617-00	ELECT	10MF	20%	16V
C562	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C563	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C564	1-124-577-11	ELECT	82MF	20%	10V
C565	1-124-577-11	ELECT	82MF	20%	10V
C566	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C567	1-124-577-11	ELECT	82MF	20%	10V

Ref.No	Part No.	Description			Remark
C569	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C570	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C571	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C572	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C573	1-135-096-21	TANTAL. CHIP	4.7MF	20%	10V
C574	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C575	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C576	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C577	1-135-096-21	TANTAL. CHIP	4.7MF	20%	10V

CONNECTOR

Ref.No	Part No.	Description
CN303	*1-506-979-21	CONNECTOR, BOARD TO BOARD 13P
CN304	*1-563-612-11	CONNECTOR, FLEXIBLE 9P
CN305	*1-564-016-00	PIN, CONNECTOR 6P
CN306	*1-506-979-21	CONNECTOR, BOARD TO BOARD 13P
CN307	*1-564-013-00	PIN, CONNECTOR 3P
CN501	*1-564-014-00	PIN, CONNECTOR 4P
CN502	*1-564-014-00	PIN, CONNECTOR 4P
CN504	*1-564-014-00	PIN, CONNECTOR 4P
CN505	*1-564-015-00	PIN, CONNECTOR 5P

DIODE

Ref.No	Part No.	Description
D301	8-719-951-12	DIODE HZ5BLL
D302	8-719-100-05	DIODE 1S2837
D305	8-719-104-24	DIODE 1S2835-T1
D308	8-719-100-05	DIODE 1S2837
D501	8-719-101-23	DIODE 1SS123
D502	8-719-101-23	DIODE 1SS123
D503	8-719-200-27	DIODE E10DS2
D504	8-719-000-12	DIODE MC931
D505	8-719-200-36	DIODE E10QS04
D506	8-719-200-36	DIODE E10QS04

FILTER

Ref.No	Part No.	Description
FL501	1-235-612-11	BPF
FL502	1-235-611-11	BPF

IC

Ref.No	Part No.	Description
IC301	8-759-942-29	IC MB88551-258K
IC302	8-759-100-95	IC UPC324G2
IC303⚠	8-759-922-54	IC S-81250AG
IC304	8-759-937-56	IC S-8054ALB
IC305	8-759-207-00	IC TA7733F
IC501	8-759-107-68	IC CX20115A
IC502	8-759-201-80	IC TC4526BF
IC503	8-752-003-50	IC CX20035
IC504	8-759-925-66	IC BA6303F
IC505	8-759-701-36	IC NJM3403AM
IC506	8-759-201-01	IC HD14066BF
IC507	8-759-928-56	IC CXA1042M
IC508⚠	8-752-003-60	IC CX20036
IC509⚠	8-759-202-45	IC CX20114
IC510	8-759-803-47	IC LA5005M

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

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Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

COIL

Ref.No	Part No.	Description	Remark
L301	1-407-177-XX	MICRO INDUCTOR 470UH	
L502	1-408-948-00	MICRO INDUCTOR 220UH	
L503	1-410-627-11	COIL, CHOKE 100UH	
L504	1-410-628-11	COIL, CHOKE 200UH	
L505	1-410-628-11	COIL, CHOKE 200UH	
L506	1-408-987-21	MICRO INDUCTOR 330UH	

IC LINK

Ref.No	Part No.	Description	Remark
PS301⚠	1-532-685-00	LINK, IC	
PS501⚠	1-532-637-00	LINK, IC	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q301	8-729-100-76	TRANSISTOR 2SA812	
Q302	8-729-100-76	TRANSISTOR 2SA812	
Q303	8-729-100-76	TRANSISTOR 2SA812	
Q306	8-729-903-10	TRANSISTOR FMW1	
Q307	8-729-901-06	TRANSISTOR DTC144EK	
Q308	8-729-100-76	TRANSISTOR 2SA812	
Q309	8-729-901-47	TRANSISTOR DTA143EK	
Q310	8-729-900-53	TRANSISTOR DTC114EK	
Q311	8-729-901-07	TRANSISTOR DTA124XK	
Q312	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q313	8-729-902-96	TRANSISTOR FMS1	
Q314	8-729-903-82	TRANSISTOR FMW2	
Q315 ⚠	8-729-104-95	TRANSISTOR 2SB1040A-5	
Q316	8-729-100-67	TRANSISTOR 2SC1623-TIL7	
Q317	8-729-901-06	TRANSISTOR DTA144EK	
Q318	8-729-904-20	TRANSISTOR FMA2	
Q319	8-729-805-25	TRANSISTOR 2SB1121	
Q320	8-729-805-25	TRANSISTOR 2SB1121	
Q321	8-729-904-20	TRANSISTOR FMA2	
Q322	8-729-901-06	TRANSISTOR DTA144EK	
Q323	8-729-903-10	TRANSISTOR FMW1	
Q324	8-729-901-06	TRANSISTOR DTC144EK	
Q325	8-729-901-06	TRANSISTOR DTC144EK	
Q326	8-729-700-10	NJL7141E-S	
Q327	8-729-700-10	NJL7141E-S	
Q328	8-729-900-53	TRANSISTOR DTC114EK	
Q501	8-729-901-06	TRANSISTOR DTC144EK	
Q502	8-729-100-76	TRANSISTOR 2SA812	
Q503	8-729-100-67	TRANSISTOR 2SC1623-T1L7	
Q504	8-729-904-20	TRANSISTOR FMA2	
Q505	8-729-100-76	TRANSISTOR 2SA812	
Q506	8-729-901-06	TRANSISTOR DTC144EK	
Q507	8-729-901-06	TRANSISTOR DTA144EK	
Q508	8-729-100-67	TRANSISTOR 2SC1623-T1L7	
Q509	8-729-102-72	TRANSISTOR 2SA812	
Q510	8-729-100-67	TRANSISTOR 2SC1623-T1L7	
Q511	8-729-100-76	TRANSISTOR 2SA812	
Q512	8-729-100-76	TRANSISTOR 2SA812	
Q513	8-729-904-20	TRANSISTOR FMA2	
Q514	8-729-901-06	TRANSISTOR DTA144EK	
Q515	8-729-904-20	TRANSISTOR FMA2	
Q516	8-729-100-66	TRANSISTOR 2SC1623	
Q517	8-729-100-76	TRANSISTOR 2SA812	
Q518	8-729-100-66	TRANSISTOR 2SC1623	
Q519	8-729-100-76	TRANSISTOR 2SA812	
Q520	8-729-100-66	TRANSISTOR 2SC1623	
Q521	8-729-100-76	TRANSISTOR 2SA812	
Q524	8-729-805-25	TRANSISTOR 2SB1121	
Q525	8-729-805-25	TRANSISTOR 2SB1121	
Q526	8-729-803-37	TRANSISTOR 2SA1237	
Q527	8-729-100-67	TRANSISTOR 2SC1623-T1L7	
Q528	8-729-903-30	TRANSISTOR DTC144TK	
Q529	8-729-903-29	TRANSISTOR DTA144TK	
Q530 ⚠	8-729-162-44	TRANSISTOR 2SB624-T1BV4	
Q531	8-729-901-06	TRANSISTOR DTC144EK	
Q532	8-729-901-06	TRANSISTOR DTC144EK	

RESISTOR

Ref.No	Part No.	Description				Remark
R301	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R302	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R303	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R304	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R305	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R306	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R307	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R308	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R309	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R310	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R311	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R312	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R313	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R314	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R315	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R316	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R317	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R318	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R319	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R320	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R321	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R322	1-216-043-00	METAL CHIP	560	5%	1/10W	
R322	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R323	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R324	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R325	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R326	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R327	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R328	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R329	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R330	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R331	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R333	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R334	1-216-109-00	METAL CHIP	330K	5%	1/10W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part numer specified.

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SS-70

Ref.No	Part No.	Description				Remark
R335	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R336	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R337	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R338	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R339	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R340	1-216-172-00	METAL CHIP	82	5%	1/8W	
R341	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R342	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R343	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R344	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R345	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R346	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R347	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R348	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R349	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R350	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R351	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R352	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R353	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R354	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R355	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R356	1-216-196-00	METAL CHIP	820	5%	1/8W	
R357	1-216-196-00	METAL CHIP	820	5%	1/8W	
R358	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R359	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R360	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R361	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R362	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R363	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R364	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R365	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R366	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R367	1-216-194-00	METAL CHIP	680	5%	1/8W	
R368	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R369	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R370	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R371	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R372	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R373	1-216-194-00	METAL CHIP	680	5%	1/8W	
R374	1-216-194-00	METAL CHIP	680	5%	1/8W	
R375	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R376	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R377	1-216-196-00	METAL CHIP	820	5%	1/8W	
R378	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R379	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R380	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R381	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R382	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R383	1-216-166-00	METAL CHIP	47	5%	1/8W	
R384	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R385	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R386	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R387	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R389	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R390	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R391	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R392	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R393	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R394	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R395	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R396	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R397	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R398	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R399	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R501	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R502	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R503	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R504	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R505	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R506	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R507	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R508	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R509	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R510	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R511	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R512	1-216-043-00	METAL CHIP	560	5%	1/10W	
R513	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R514	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R515	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R516	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R517	1-216-295-00	METAL CHIP	0	5%	1/10W	
R519	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R520	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R521	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R522	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R523	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R524	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R525	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R526	1-216-043-00	METAL CHIP	560	5%	1/10W	
R527	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R529	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R530	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R531	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R532	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R533	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R534	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R535	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R537	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R538	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R539	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R540	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R541	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R542	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R543	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R544	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R545	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R546	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R547	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R548	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R549	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R550	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R551	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R552	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R553	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R554	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R555	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R556	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R557	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R558	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R559	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R560	1-216-115-00	METAL CHIP	560K	5%	1/10W	
R561	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R562	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R563	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R564	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R565	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R569	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R570	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R571	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R572	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R573	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R574	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R575	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R576	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R577	1-216-041-00	METAL CHIP	470	5%	1/10W	
R578	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R579	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R580	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R581	1-216-025-00	METAL CHIP	100	5%	1/10W	
R582	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R583	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R584	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R585	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R586	1-216-047-00	METAL CHIP	820	5%	1/10W	
R587	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R589	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R590	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R591	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R592	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R593	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R594	1-216-295-00	METAL CHIP	0	5%	1/10W	
R595	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R596	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R597	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R598	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R599	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R600	1-214-972-00	METAL	0.22	5%	1/4W	
R601	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R602	1-216-304-11	METAL CHIP	3.3	5%	1/10W	

Ref.No	Part No.	Description				Remark
R603	1-216-304-11	METAL CHIP	3.3	5%	1/10W	
R604	1-216-304-11	METAL CHIP	3.3	5%	1/10W	
R605	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R607	1-216-295-00	METAL CHIP	0	5%	1/10W	
R608	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R609	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R610	1-216-041-00	METAL CHIP	470	5%	1/10W	
R611	1-216-041-00	METAL CHIP	470	5%	1/10W	
R612	1-216-025-00	METAL CHIP	100	5%	1/10W	
R613	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R614	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R615	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R616	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R617	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R618	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R620	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R621	1-216-214-00	METAL CHIP	4.7K	5%	1/8W	
R622	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R623	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R624	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R628	1-216-295-00	METAL CHIP	0	5%	1/10W	
R630	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R633	1-216-025-00	METAL CHIP	100	5%	1/10W	
R634	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R635	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R636	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R637	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R638	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R639	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R640	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R641	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R642	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R643	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R644	1-216-270-00	METAL CHIP	1M	5%	1/8W	
R645	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R646	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R647	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R648	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R649	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R651	1-216-025-00	METAL CHIP	100	5%	1/10W	
R652	1-216-033-00	METAL CHIP	220	5%	1/10W	
R653	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R654	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R655	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R656	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R657	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R658	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R659	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R660	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R662	1-216-033-00	METAL CHIP	220	5%	1/10W	
R663	1-216-001-00	METAL CHIP	10	5%	1/10W	
R664	1-216-296-00	METAL CHIP	0	5%	1/8W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R665	1-216-296-00	METAL CHIP	0	5%	1/8W	
		VARIABLE RESISTOR				
RV502	1-230-873-11	RES, ADJ, METAL GLAZE 47K				
		JUMPER				
W301	1-535-639-11	WIRE, JUMPER (10 CORE)				
		CRYSTAL				
X301	1-567-143-00	OSCILLATOR, CERAMIC (6MHz)				

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*A-7060-687-A AU-31 BOARD, COMPLETE
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		CAPACITOR				
C401	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V	
C402	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V	
C403	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C404	1-124-245-00	ELECT	4.7MF	20%	16V	
C405	1-135-099-00	TANTAL. CHIP	2.2MF	20%	6.3V	
C406	1-124-222-00	ELECT	22MF	20%	6.3V	
C407	1-163-145-00	CERAMIC CHIP	0.0015MF	10%	50V	
C408	1-163-123-00	CERAMIC CHIP	180PF	5%	50V	
C409	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V	
C410	1-163-014-00	CERAMIC CHIP	0.0027MF	10%	50V	
C411	1-135-099-00	TANTAL. CHIP	2.2MF	20%	6.3V	
C412	1-135-104-00	TANTAL. CHIP	10MF	20%	4V	
C413	1-163-020-00	CERAMIC CHIP	0.0082MF	10%	50V	
C414	1-163-137-00	CERAMIC CHIP	680PF	5%	50V	
C415	1-135-104-00	TANTAL. CHIP	10MF	20%	4V	
C416	1-135-091-00	TANTAL. CHIP	1MF	20%	16V	
C417	1-163-125-00	CERAMIC CHIP	220PF	10%	50V	
C418	1-162-587-91	CERAMIC CHIP	0.039MF	10%	25V	
C419	1-163-088-00	CERAMIC CHIP	5PF	0.25PF	50V	
C420	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V	
C421	1-135-104-00	TANTAL. CHIP	10MF	20%	4V	
C422	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V	
C423	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C424	1-124-225-00	ELECT	100MF	20%	6.3V	
C425	1-124-225-00	ELECT	100MF	20%	6.3V	
C426	1-124-225-00	ELECT	100MF	20%	6.3V	
C427	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V	
C428	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C429	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	
C430	1-163-123-00	CERAMIC CHIP	180PF	5%	50V	
C431	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V	
C432	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V	
C433	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
C434	1-163-014-00	CERAMIC CHIP	0.0027MF	10%	50V	
C435	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V	

Ref.No	Part No.	Description				Remark
C436	1-135-104-00	TANTAL. CHIP	10MF	20%	4V	
C437	1-163-133-00	CERAMIC CHIP	470PF	10%	50V	
C438	1-135-104-00	TANTAL. CHIP	10MF	20%	4V	
C439	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C440	1-135-104-00	TANTAL. CHIP	10MF	20%	4V	
		FILTER				
FL401	1-235-398-11	BPF				
		IC				
IC401⚠	8-752-003-79	IC CX20037A				
		COIL				
L401	1-408-793-21	INDUCTOR CHIP	220UH			
		TRANSISTOR				
Q401	8-729-901-01	TRANSISTOR DTC144EK				
Q402	8-729-116-06	TRANSISTOR 2SK160-K6				
Q403	8-729-100-67	TRANSISTOR 2SC1623-T1L7				
Q404	8-729-100-67	TRANSISTOR 2SC1623-T1L7				
Q405	8-729-100-76	TRANSISTOR 2SA812				
Q406	8-729-100-67	TRANSISTOR 2SC1623-T1L7				
		RESISTOR				
R401	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R402	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R403	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R404	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R405	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R406	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R407	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R408	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R409	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R410	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R411	1-216-045-00	METAL CHIP	680	5%	1/10W	
R412	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R413	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R414	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R415	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R416	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R417	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R418	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R419	1-249-416-11	CARBON	820	5%	1/4W	
R420	1-216-047-00	METAL CHIP	820	5%	1/10W	
R421	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R422	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R423	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R424	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R425	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R426	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R427	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R428	1-216-077-00	METAL CHIP	15K	5%	1/10W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R429	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R430	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R431	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R432	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R433	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R434	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R435	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R436	1-216-041-00	METAL CHIP	470	5%	1/10W	
R437	1-216-043-00	METAL CHIP	560	5%	1/10W	
R438	1-216-025-00	METAL CHIP	100	5%	1/10W	
R439	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R440	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	

VARIABLE RESISTOR

RV401	1-230-870-11	RES, ADJ, METAL GLAZE 10K
RV402	1-230-871-11	RES, ADJ, METAL GLAZE 22K

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*A-7060-688-A MR-8 BOARD, COMPLETE
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CAPACITOR

C101	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C102	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C103	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C104	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C105	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C108	1-124-222-00	ELECT	22MF	20%	6.3V
C110	1-127-494-00	ELECT(SOLID)	3.3MF	20%	16V
C111	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C151	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V

CONNECTOR

CN101	*1-564-016-00	PIN, CONNECTOR 6P
CN102	*1-564-013-00	PIN, CONNECTOR 3P
CN105	*1-564-003-00	PIN, CONNECTOR 4P

DIODE

D153	8-719-812-44	DIODE TL0124
D154	8-719-812-41	DIODE TLR124

COIL

L101	1-408-777-00	INDUCTOR CHIP 10UH
L102	1-408-948-00	MICRO INDUCTOR 220UH

TRANSISTOR

Q101	8-729-100-76	TRANSISTOR 2SA812
Q102	8-729-117-54	TRANSISTOR 2SA1175
Q103	8-729-100-76	TRANSISTOR 2SA812
Q151	8-729-901-06	TRANSISTOR DTA144EK

RESISTOR

Ref.No	Part No.	Description				Remark
R101	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R102	1-216-013-00	METAL CHIP	33	5%	1/10W	
R103	⚠1-216-019-00	METAL CHIP	56	5%	1/10W	
R104	1-216-035-00	METAL CHIP	270	5%	1/10W	
R105	1-216-033-00	METAL CHIP	220	5%	1/10W	
R106	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R107	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R108	1-216-025-00	METAL CHIP	100	5%	1/10W	
R109	1-216-043-00	METAL CHIP	560	5%	1/10W	
R151	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R152	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R153	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R154	1-216-095-00	METAL CHIP	82K	5%	1/10W	

VARIABLE RESISTOR

RV151	1-230-870-11	RES, ADJ, METAL GLAZE 10K
RV152	1-230-876-11	RES, ADJ, METAL GLAZE 470K
RV153	1-230-875-21	RES, ADJ, METAL GLAZE 220K
RV155	1-230-875-21	RES, ADJ, METAL GLAZE 220K
RV156	1-230-873-11	RES, ADJ, METAL GLAZE 47K

SWITCH

S101	1-554-364-00	SWITCH, SLIDE (EJECT)

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*A-7030-068-A CAMERA BOARD ASSY
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(VC-20, VC-21, VC-22, CN-27, MA-21,
DS-24, SW-71, AW-9, AS-20, SK-21,
AND RZ-1 BOARD)

1-623-012-11	FP-80 BOARD (FLEXIBLE)
1-623-013-11	FP-81 BOARD (FLEXIBLE)
1-623-019-11	FP-82 BOARD (FLEXIBLE)

*A-7060-839-A VC-20 BOARD, COMPLETE
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A-7068-056-A DT-61 BOARD, COMPLETE (HIC)

A-7068-088-A SH-2 BOARD, COMPLETE (HIC)

CAPACITOR

C701	1-162-637-11	CERAMIC CHIP	0.47MF		16V
C702	1-162-637-11	CERAMIC CHIP	0.47MF		16V
C703	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C704	1-135-083-00	TANTAL. CHIP	0.47MF	20%	25V
C705	1-162-637-11	CERAMIC CHIP	0.47MF		16V
C706	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C707	1-162-637-11	CERAMIC CHIP	0.47MF		16V
C708	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C709	1-163-101-00	CERAMIC CHIP	22PF	5%	50V

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C710	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C721	1-163-089-00	CERAMIC CHIP	6PF	0.5PF	50V
C722	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C723	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C724	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C725	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C725	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C726	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C727	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C728	1-135-101-21	TANTAL. CHIP	22MF	20%	6.3V
C729	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C730	1-135-093-21	TANTAL. CHIP	10MF	20%	10V
C731	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C732	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C733	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C734	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C735	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C736	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C737	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C744	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C745	1-135-100-21	TANTAL. CHIP	6.8MF	20%	6.3V
C746	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C751	1-124-229-00	ELECT	33MF	20%	10V
C752	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C753	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C754	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C755	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C761	1-124-222-00	ELECT	22MF	20%	6.3V
C762	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C763	1-131-387-00	TANTALUM	47MF	10%	6.3V
C764	1-124-234-00	ELECT	22MF	20%	16V
C765	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C766	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C767	1-124-234-00	ELECT	22MF	20%	16V
C768	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C769	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C770	1-124-234-00	ELECT	22MF	20%	16V
C771	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C772	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C773	1-124-234-00	ELECT	22MF	20%	16V
C774	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C775	1-161-013-00	CERAMIC	0.01MF	10%	25V

TRIMMER

Ref.No	Part No.	Description
CT721	1-141-331-11	CAP, VAR, TRIMMER (CHIP)

DIODE

Ref.No	Part No.	Description
D701	8-719-801-45	DIODE 1SS187

IC

Ref.No	Part No.	Description
※IC701	8-750-010-31	IC IU018CK-AA (CCD IMAGER)
IC731	8-752-321-16	IC CXD1030M

COIL

Ref.No	Part No.	Description
L731	1-410-389-11	INDUCTOR CHIP 47UH
L761	1-407-165-XX	MICRO INDUCTOR 47UH
L762	1-408-960-21	MICRO INDUCTOR 1.5UH
L763	1-408-960-21	MICRO INDUCTOR 1.5UH
L764	1-407-165-XX	MICRO INDUCTOR 47UH

TRANSISTOR

Ref.No	Part No.	Description
Q701	8-729-175-72	TRANSISTOR 2SC2757
Q721	8-729-175-73	TRANSISTOR 2SC2757
Q722 ⚠	8-729-175-72	TRANSISTOR 2SC2757
Q731	8-729-100-76	TRANSISTOR 2SA812

RESISTOR

Ref.No	Part No.	Description			Remark
R701	1-216-075-00	METAL CHIP	12K	5%	1/10W
R702	1-216-089-00	METAL CHIP	47K	5%	1/10W
R703	1-216-075-00	METAL CHIP	12K	5%	1/10W
R704	1-216-091-00	METAL CHIP	56K	5%	1/10W
R705	1-216-089-00	METAL CHIP	47K	5%	1/10W
R706	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R707	1-216-025-00	METAL CHIP	100	5%	1/10W
R708	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R709	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R721	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R722	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R723	1-216-039-00	METAL CHIP	390	5%	1/10W
R724	1-216-039-00	METAL CHIP	390	5%	1/10W
R725	1-216-081-00	METAL CHIP	22K	5%	1/10W
R726	1-216-041-00	METAL CHIP	470	5%	1/10W
R731	1-216-033-00	METAL CHIP	220	5%	1/10W
R732	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R733	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R734	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R735	1-216-077-00	METAL CHIP	15K	5%	1/10W
R736	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R737	1-216-295-00	METAL CHIP	0	5%	1/10W
R751	1-216-025-00	METAL CHIP	100	5%	1/10W
R752	1-216-049-00	METAL CHIP	1K	5%	1/10W

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*A-7060-834-A VC-21 BOARD, COMPLETE
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A-7060-835-A MX-2 BOARD, COMPLETE (HIC)

CAPACITOR

Ref.No	Part No.	Description			Remark
C781	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C782	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C783	1-163-213-00	CERAMIC CHIP	0.0022MF	10%	50V
C784	1-163-213-00	CERAMIC CHIP	0.0022MF	10%	50V
C785	1-163-213-00	CERAMIC CHIP	0.0022MF	10%	50V
C786	1-124-234-00	ELECT	22MF	20%	10V

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

※ The IC701 and IC002 have not been mounted on the already mounted VC-20 board and DT-61 board respectively. Be sure to read "Precautions for Replacement of CCD Imager" on page 87. When changing the mounted VC-20 board and CCD Imager.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C787	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C788	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C789	1-124-584-00	ELECT 100MF	20%	10V
C790	1-135-105-00	TANTAL. CHIP 33MF	20%	4V
C791	1-135-105-00	TANTAL. CHIP 33MF	20%	4V

FILTER

Ref.No	Part No.	Description
FL781	1-235-394-11	FILTER, LOW PASS (YH)

IC

Ref.No	Part No.	Description
IC781	8-759-914-44	IC TL431CLPB

COIL

Ref.No	Part No.	Description
L781	1-408-767-21	INDUCTOR CHIP 1.5UH
L782	1-410-369-11	INDUCTOR CHIP 1UH
L783	1-410-337-11	MICRO INDUCTOR 1UH
L784	1-410-337-11	MICRO INDUCTOR 1UH
L785	1-410-369-11	INDUCTOR CHIP 1UH
L786	1-408-785-21	INDUCTOR CHIP 47UH
L787	1-408-777-00	INDUCTOR CHIP 10UH

RESISTOR

Ref.No	Part No.	Description			Remark
R781	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R782	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R783	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R784	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R785	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R786	1-216-081-00	METAL CHIP	22K	5%	1/10W
R789	1-216-081-00	METAL CHIP	22K	5%	1/10W
R790	1-216-081-00	METAL CHIP	22K	5%	1/10W
R791	1-216-049-00	METAL CHIP	1K	5%	1/10W
R792	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R793	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R794	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R795	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R796	1-216-069-00	METAL CHIP	6.8K	5%	1/10W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV781	1-230-523-11	RES, ADJ, METAL GLAZE 10K

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*A-7060-836-A VC-22 BOARD, COMPLETE

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*A-7060-888-A IA-1 BOARD, COMPLETE (HIC)

CAPACITOR

Ref.No	Part No.	Description		Remark
C801	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C802	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C803	1-163-013-00	CERAMIC CHIP 0.0022MF	10%	50V
C804	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C805	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C806	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C807	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C808	1-135-085-21	TANTAL CHIP 4.7MF	20%	35V
C809	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C810	1-135-093-21	TANTAL, CHIP 10MF	20%	16V
C811	1-162-638-11	CERAMIC CHIP 1MF		16V
C812	1-135-101-21	TANTAL, CHIP 22MF	20%	6.3V
C813	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C814	1-163-108-00	CERAMIC CHIP 43PF	5%	50V
C815	1-135-093-21	TANTAL, CHIP 10MF	20%	10V
C816	1-135-093-21	TANTAL, CHIP 10MF	20%	16V
C817	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C861	1-135-092-21	TANTAL. CHIP 3.3MF	20%	16V
C862	1-124-225-00	ELECT 100MF	20%	6.3V
C863	1-163-081-00	CERAMIC CHIP 0.22MF		25V
C881	1-135-101-21	TANTAL. CHIP 22MF	20%	6.3V
C882	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C883	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C884	1-124-225-00	ELECT 100MF	20%	6.3V

CONNECTOR

Ref.No	Part No.	Description
CN861	*1-564-003-00	PIN, CONNECTOR 4P
CN881	*1-564-007-00	PIN, CONNECTOR 8P

DIODE

Ref.No	Part No.	Description
D801	8-719-801-45	DIODE 1SS187
D802	8-719-100-05	DIODE 1S2837
D861	8-719-100-05	DIODE 1S2837

DELAY LINE

Ref.No	Part No.	Description
DL801	1-415-448-21	DELAY LINE

IC

Ref.No	Part No.	Description
IC801	8-759-908-11	IC CX20055

COIL

Ref.No	Part No.	Description
L801	1-408-785-21	INDUCTOR CHIP 47UH
L881	1-407-165-XX	MICRO INDUCTOR 47UH

TRANSISTOR

Ref.No	Part No.	Description
Q801	8-729-100-66	TRANSISTOR 2SC1623
Q802	8-729-100-66	TRANSISTOR 2SC1623
Q803	8-729-100-66	TRANSISTOR 2SC1623
Q804	8-729-100-76	TRANSISTOR 2SA812
Q805	8-729-100-76	TRANSISTOR 2SA812
Q806	8-729-100-66	TRANSISTOR 2SC1623
Q807	8-729-100-66	TRANSISTOR 2SC1623
Q808	8-729-100-66	TRANSISTOR 2SC1623
Q809	8-729-100-66	TRANSISTOR 2SC1623
Q861	8-729-901-00	TRANSISTOR DTC124EK

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
		RESISTOR	
R801	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R802	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R803	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R804	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R805	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R806	1-216-082-00	METAL CHIP 24K 5% 1/10W	
R807	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R808	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R809	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R810	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R811	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R812	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R813	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R814	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R815	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R816	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R817	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R818	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R819	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R820	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R821	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R822	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R823	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R824	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R825	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R826	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R827	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R828	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R829	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R830	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R831	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R832	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R833	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R834	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R835	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R836	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R837	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R838	1-216-047-00	METAL CHIP 820 5% 1/10W	
R839	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R840	1-216-295-00	METAL CHIP 0 5% 1/10W	
R861	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R862	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R863	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R864	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R866	1-216-295-00	METAL CHIP 0 5% 1/10W	
R867	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R868	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
		VARIABLE RESISTOR	
RV801	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV802	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV803	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV804	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV805	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV806	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV808	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV809	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV810	1-230-870-11	RES, ADJ, METAL GLAZE 10K	

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*A-7060-890-A DS-24 BOARD, COMPLETE
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		CAPACITOR	
C101	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C103	1-163-121-00	CERAMIC CHIP 150PF 5% 50V	
C102	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C104	1-163-121-00	CERAMIC CHIP 150PF 5% 50V	
C105	1-163-021-00	CERAMIC CHIP 0.01MF 50V	
C106	1-135-101-21	TANTAL. CHIP 22MF 20% 6.3V	
C107	1-163-021-00	CERAMIC CHIP 0.01MF 50V	
C108	1-163-121-00	CERAMIC CHIP 150PF 5% 50V	
C109	1-163-121-00	CERAMIC CHIP 150PF 5% 50V	
C110	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C111	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C112	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C113	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C114	1-163-095-00	CERAMIC CHIP 12PF 5% 50V	
C115	1-163-077-00	CERAMIC CHIP 0.1MF 50V	
C116	1-163-077-00	CERAMIC CHIP 0.1MF 50V	
C117	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C118	1-135-101-21	TANTAL. CHIP 22MF 20% 6.3V	
C120	1-135-083-00	TANTAL. CHIP 0.47MF 20% 25V	
C121	1-163-033-00	CERAMIC CHIP 0.022MF 10% 25V	
C124	1-163-099-00	CERAMIC CHIP 18PF 5% 50V	
C125	1-163-093-00	CERAMIC CHIP 10PF 5% 50V	
C126	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C129	1-135-115-91	TANTAL. CHIP 10MF 20% 10V	
C130	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C131	1-135-083-00	TANTAL. CHIP 0.47MF 20% 25V	
C132	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C133	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C134	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C135	1-135-099-00	TANTAL. CHIP 2.2MF 20% 6.3V	
C138	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C139	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C140	1-135-098-21	TANTAL. CHIP 47MF 20% 6.3V	
C141	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C142	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C143	1-161-013-00	CERAMIC 0.01MF 10% 25V	
		CONNECTOR	
CN251	*1-564-012-00	PIN, CONNECTOR 2P	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
CN254	*1-564-013-00	PIN, CONNECTOR 3P	
CN255	*1-564-017-00	PIN, CONNECTOR 7P	
CN257	*1-564-013-00	PIN, CONNECTOR 3P	
CN259	*1-563-608-11	CONNECTOR, FLEXIBLE 5P	
		TRIMMER	
CT101	1-141-331-11	CAP, VAR, TRIMMER (CHIP)	
CT102	1-141-359-51	CAP, VAR, TRIMMER (CHIP)	
CT103	1-141-311-11	CAP, VAR, TRIMMER (CHIP)	
		IC	
IC101	8-752-032-48	IC CXA1157M	
IC102	8-759-945-24	IC MB673194U	
IC103	8-759-927-98	IC MB8464-15LPF	
IC104	8-759-101-12	IC UPC311G2	
IC105	8-759-106-66	IC UPD74HC08G	
IC106	8-759-200-90	IC TC4538BF	
IC107	8-759-112-72	IC UPD6142G-101	
IC108	8-759-113-45	IC UPD7508BGB-502	
IC111	8-759-937-56	IC S-8054ALB	
IC112	8-759-940-33	IC S-8052ALO-LG-S	
IC113	8-759-204-94	IC TC74HC00F	
		COIL	
L101	1-410-377-11	INDUCTOR CHIP 4.7UH	
L104	1-410-387-11	INDUCTOR CHIP 33UH	
L105	1-410-369-11	INDUCTOR CHIP 1UH	
L107	1-410-390-11	INDUCTOR CHIP 56UH	
L108	1-410-369-11	INDUCTOR CHIP 1UH	
		TRANSISTOR	
Q101	8-729-102-62	TRANSISTOR 2SC1623-L7	
Q102	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q103	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q104	8-729-100-76	TRANSISTOR 2SA812	
Q105	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q106	8-729-100-76	TRANSISTOR 2SA812	
Q107	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q108	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q109	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q110	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q111	8-729-100-76	TRANSISTOR 2SA812	
Q113	8-729-900-51	TRANSISTOR DTA114TK	
Q114	8-729-901-03	TRANSISTOR DTC144WK	
Q115	8-729-100-76	TRANSISTOR 2SA812	
Q116	8-729-901-03	TRANSISTOR DTC144WK	
Q117	8-729-900-99	TRANSISTOR DTA144WK	
Q126	8-729-902-96	TRANSISTOR FMS1	
Q127	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q128	8-729-220-93	TRANSISTOR 2SK209G	
		RESISTOR	
R101	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R102	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R103	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R104	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R105	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R106	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R107	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R108	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R109	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R110	1-216-687-11	METAL CHIP 33K 0.50% 1/10W	
R111	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R112	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R113	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R114	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R115	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R116	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R117	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R118	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R119	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R120	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R121	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R122	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R123	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R124	1-216-041-00	METAL CHIP 470 5% 1/10W	
R125	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R126	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R127	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R128	1-216-689-11	METAL CHIP 39K 0.50% 1/10W	
R129	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R130	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R131	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R132	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R133	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R134	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R135	1-216-043-00	METAL CHIP 560 5% 1/10W	
R136	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R137	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R139	1-216-295-00	METAL CHIP 0 5% 1/10W	
R140	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R141	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R142	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R143	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R144	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R145	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R146	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R147	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R148	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R149	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R150	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R151	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R152	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R153	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R154	1-216-295-00	METAL CHIP 0 5% 1/10W	
R157	1-216-295-00	METAL CHIP 0 5% 1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R158	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R159	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R160	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R161	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R162	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R163	1-216-105-00	METAL CHIP 220K 5% 1/10W	
R164	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R165	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R166	1-216-129-00	METAL CHIP 2.2M 5% 1/10W	
R167	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R179	1-216-687-11	METAL CHIP 33K 0.50% 1/10W	
R180	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R181	1-216-037-00	METAL CHIP 330 5% 1/10W	
R182	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R183	1-216-689-11	METAL CHIP 39K 0.50% 1/10W	
R184	1-216-689-11	METAL CHIP 39K 0.50% 1/10W	
R185	1-216-295-00	METAL CHIP 0 5% 1/10W	
R186	1-216-295-00	METAL CHIP 0 5% 1/10W	
R187	1-216-025-00	METAL CHIP 100 5% 1/10W	
R188	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R189	1-216-105-00	METAL CHIP 220K 5% 1/10W	
R190	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R191	1-216-686-11	METAL CHIP 30K 0.50% 1/10W	
R192	1-216-689-11	METAL CHIP 39K 0.50% 1/10W	
R193	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R194	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R195	1-216-041-00	METAL CHIP 470 5% 1/10W	
R196	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R197	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R199	1-216-041-00	METAL CHIP 470 5% 1/10W	
R200	1-216-003-11	METAL CHIP 12 5% 1/10W	
		VARIABLE RESISTOR	
RV101	1-230-524-11	RES, ADJ, METAL GLAZE 22K	
RV102	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
		CRYSTAL	
X101	1-527-997-00	VIBRATOR, CRYSTAL (32.768MHz)	

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*A-7070-481-A MA-21 BOARD, COMPLETE

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Ref.No	Part No.	Description	Remark
		CAPACITOR	
C451	1-124-225-00	ELECT 100MF 20% 6.3V	
C452	1-124-224-00	ELECT 47MF 20% 6.3V	
C453	1-135-072-21	TANTAL. CHIP 0.22MF 20% 35V	
C454	1-135-072-21	TANTAL. CHIP 0.22MF 20% 35V	
C455	1-163-141-00	CERAMIC CHIP 0.001MF 10% 50V	
C456	1-163-035-00	CERAMIC CHIP 0.047MF 10% 25V	
C457	1-135-099-00	TANTAL. CHIP 2.2MF 20% 6.3V	
		CONNECTOR	
CN451	*1-564-013-00	PIN, CONNECTOR 3P	
		IC	
IC451	8-759-111-56	IC UPC4572G2	
		TRANSISTOR	
Q451	8-729-162-44	TRANSISTOR 2SB624-BV4	
		RESISTOR	
R451	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R452	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R453	1-216-162-00	METAL CHIP 33 5% 1/8W	
R454	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R455	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R456	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R457	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R458	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R459	1-216-748-11	METAL CHIP 39K 5% 1/10W	
R460	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R461	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R462	1-216-001-00	METAL CHIP 10 5% 1/10W	
R463	1-216-296-00	METAL CHIP 0 5% 1/8W	
R464	1-216-296-00	METAL CHIP 0 5% 1/8W	
R465	1-216-296-00	METAL CHIP 0 5% 1/8W	

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*A-7070-467-A CN-27 BOARD, COMPLETE

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		CAPACITOR	
C892	1-163-101-00	CERAMIC CHIP 22PF 5% 50V	
C893	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C894	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C895	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
		COIL	
L882	1-410-387-11	INDUCTOR CHIP 33UH	
		RESISTOR	
R816	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R890	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R891	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R892	1-216-295-00	METAL CHIP 0 5% 1/10W	
		VARIABLE RESISTOR	
RV721	1-230-871-11	RES, ADJ, METAL GLAZE 22K	
RV722	1-230-871-11	RES, ADJ, METAL GLAZE 22K	
RV723	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV807	1-230-867-11	RES, ADJ, METAL GLAZE 1K	

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
	*A-7070-468-A	RZ-1 BOARD, COMPLETE *********************	

CAPACITOR

Ref.No	Part No.	Description	Remark
C127	1-135-115-91	TANTAL. CHIP 10MF 20% 10V	
C128	1-135-115-91	TANTAL. CHIP 10MF 20% 10V	
C136	1-163-021-00	CERAMIC CHIP 0.01MF 50V	
C137	1-163-021-00	CERAMIC CHIP 0.01MF 50V	

DIODE

Ref.No	Part No.	Description	Remark
D101	8-719-101-23	DIODE 1SS123	

IC

Ref.No	Part No.	Description	Remark
IC109	8-759-803-47	IC LA5005M	
IC110	8-759-803-47	IC LA5005M	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q118	8-729-100-76	TRANSISTOR 2SA812	
Q119	8-729-901-01	TRANSISTOR DTC144EK	
Q120	8-729-100-76	TRANSISTOR 2SA812	
Q121	8-729-901-01	TRANSISTOR DTC144EK	
Q123	8-729-901-06	TRANSISTOR DTA144EK	
Q124	8-729-902-96	TRANSISTOR FMS1	
Q125	8-729-903-10	TRANSISTOR FMW1	

RESISTOR

Ref.No	Part No.	Description	Remark
R148	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R168	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R169	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R170	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R171	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R172	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R173	1-216-041-00	METAL CHIP 470 5% 1/10W	
R174	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R175	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R176	1-216-041-00	METAL CHIP 470 5% 1/10W	
R177	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R178	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	

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Ref.No	Part No.	Description	Remark
	*A-7070-469-A	SK-21 BOARD, COMPLETE **********************	

SWITCH

Ref.No	Part No.	Description	Remark
S948	1-554-371-31	SWITCH, TACT (MEMORY)	
S949	1-554-371-41	SWITCH, TACT (COLOR)	
S950	1-554-371-41	SWITCH, TACT (ON/OFF)	

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Ref.No	Part No.	Description	Remark
	*A-7085-004-A	AW-9 BOARD, COMPLETE ********************* (AS-20 BOARD)	
	*1-623-016-11	AS-20 BOARD	
	3-713-724-01	HOLDER, AS SENSOR	

SENSOR

Ref.No	Part No.	Description	Remark
SB901	1-807-684-11	SENSOR, WHITE BALANCE	

AW-9 BOARD

CAPACITOR

Ref.No	Part No.	Description	Remark
C901	1-109-539-00	MICA 150PF 5% 100V	
C902	1-130-475-00	MYLAR 0.0022MF 5% 50V	
C903	1-124-462-00	ELECT 10MF 20% 6.3V	
C904	1-163-077-00	CERAMIC CHIP 0.1MF 50V	
C905	1-124-462-00	ELECT 10MF 20% 6.3V	
C906	1-162-638-11	CERAMIC CHIP 1MF 16V	
C907	1-163-104-00	CERAMIC CHIP 30PF 5% 50V	
C908	1-163-104-00	CERAMIC CHIP 30PF 5% 50V	
C911	1-162-637-11	CERAMIC CHIP 0.47MF 16V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN252	*1-564-007-00	PIN, CONNECTOR 8P	
CN258	*1-564-012-00	PIN, CONNECTOR 2P	
CN260	*1-564-012-00	PIN, CONNECTOR 2P	
CN901	*1-564-004-00	PIN, CONNECTOR 5P	
CN902	*1-564-005-00	PIN, CONNECTOR 6P	

DIODE

Ref.No	Part No.	Description	Remark
D901	8-719-100-03	DIODE 1S2835	

IC

Ref.No	Part No.	Description	Remark
IC901	8-759-906-53	IC TL062CPS	
IC902	8-759-106-23	IC UPD4066BG	
IC903	8-759-100-93	IC UPC393G2	
IC904	8-759-011-87	IC MC146805F2FP-SC82435	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q901	8-729-903-30	TRANSISTOR DTC144TK	
Q902	8-729-903-30	TRANSISTOR DTC144TK	
Q903	8-729-901-01	TRANSISTOR DTC144EK	
Q904	8-729-901-01	TRANSISTOR DTC144EK	
Q905	8-729-901-01	TRANSISTOR DTC144EK	
Q906	8-729-901-01	TRANSISTOR DTC144EK	
Q907	8-729-901-06	TRANSISTOR DTA144EK	
Q908	8-729-901-06	TRANSISTOR DTA144EK	
Q909	8-729-901-06	TRANSISTOR DTA144EK	
Q910	8-729-901-06	TRANSISTOR DTA144EK	
Q911	8-729-901-06	TRANSISTOR DTA144EK	
Q912	8-729-901-01	TRANSISTOR DTC144EK	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
		RESISTOR	
R901	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R902	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R903	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R904	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R905	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R906	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R907	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R908	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R909	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R910	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R911	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R912	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R913	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R914	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R915	1-216-103-00	METAL CHIP 180K 5% 1/10W	
R916	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R917	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R918	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R921	1-216-115-00	METAL CHIP 560K 5% 1/10W	
R922	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R923	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R924	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R927	1-216-041-00	METAL CHIP 470 5% 1/10W	
R928	1-216-041-00	METAL CHIP 470 5% 1/10W	
R929	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R930	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R931	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R932	1-216-075-00	METAL CHIP 12K 5% 1/10W	
		VARIABLE RESISTOR	
RV901	1-230-871-11	RES, ADJ, METAL GLAZE 22K	
		BALANCE SENSOR	
SB901	1-807-684-11	SENSOR, WHITE BALANCE	
		CONNECTOR	
W902	*1-506-592-11	PIN, BOARD TO BOARD 4P	
		CRYSTAL	
X901	1-567-192-11	OSCILLATOR, CERAMIC	

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*1-623-009-11 SW-71 BOARD
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		SWITCH	
S941	1-570-871-11	SWITCH, SLIDE (WHITE BALANCE)	
S942	1-570-910-21	SWITCH, TACTIL (REFLOW TYPE) (BACKLIGHT)	
S943	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (REC REV)	
S944	1-570-910-21	SWITCH, TACTIL (REFLOW TYPE) (PUSH AUTO)	
S945	1-570-870-11	SWITCH, SLIDE (FOUCUS)	
S946	1-570-910-21	SWITCH, TACTIL (REFLOW TYPE) (DATE, +)	
S947	1-570-910-21	SWITCH, TACTIL (REFLOW TYPE)(TIME, NEXT)	
		TERMINAL PIN	
TP901	*1-535-622-11	PIN, TERMINAL	
TP902	*1-535-622-11	PIN, TERMINAL	

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A-7060-693-A FP-53 BOARD, COMPLETE
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	3-713-904-01	HOLDER (2), LED	
		DIODE	
D302	8-719-940-81	DIODE GL452S	
D303	8-719-801-55	TLP907-0	
D304	8-719-801-55	TLP907-0	
		SWITCH	
S301	1-570-869-11	SWITCH, PUSH (2 KEY)	

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1-623-007-11 SK-19 BOARD (FLEXIBLE)
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		RESISTOR	
R001	1-216-296-00	METAL CHIP 0 5% 1/8W	
R002	1-216-296-00	METAL CHIP 0 5% 1/8W	
		SWITCH	
S351	1-570-773-21	SWITCH, SLIDER	
S352	1-554-371-31	SWITCH, TACT	
S353	1-554-371-31	SWITCH, TACT	
S354	1-554-371-31	SWITCH, TACT	
S355	1-554-371-31	SWITCH, TACT	
S356	1-554-371-31	SWITCH, TACT	

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*1-623-008-11 LI-3 BOARD
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1-550-104-11 HOLDER, BATTERY

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*1-620-826-13 MJ-12 BOARD
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		CAPACITOR	
C471	1-163-035-00	CERAMIC CHIP 0.047MF	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
		CONNECTOR			
CN471	*1-564-014-00	PIN, CONNECTOR 4P			
		DIODE			
D471	8-719-911-19	DIODE 1SS119			
		JACK			
J471	1-507-921-00	JACK			
J472	1-563-454-11	JACK, MINIATURE			
**					
	1-620-629-11	FP-49 BOARD (FLEXIBLE) ***********************			
	1-537-005-21	JACK BOARD			
**					
	*1-620-827-11	RC-21 BOARD ************			
		DIODE			
D681	8-719-100-68	DIODE RD13EB2			
D682	8-719-100-68	DIODE RD13EB2			
		SWITCH			
S681	1-570-689-11	SWITCH, KEY BOARD (START/STOP)			
S682	1-553-977-41	SWITCH, SLIDE (STANDBY)			
**					
	*1-623-014-11	TA-50 BOARD ************			
	1-566-607-11	PLUG (TERMINAL BOARD (A))			
**					
	*1-623-018-11	FH-14 BOARD ************			
		CAPACITOR			
C681	1-123-321-00	ELECT	220MF	20%	16V
		CONNECTOR			
CN601	*1-564-002-00	PIN, CONNECTOR 3P			
		FUSE			
F901	⚠1-532-777-21	FUSE, MICRO (SECONDARY)			
F902	⚠1-532-625-00	FUSE, GLASS TUBE			
F903	⚠1-532-777-21	FUSE, MICRO (SECONDARY)			
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Ref.No	Part No.	Description			Remark
	*A-7060-738-A	VF-8 (A) BOARD, COMPLETE ************************			
	1-526-926-21	SOCKET ASSY, CRT			
		CAPACITOR			
C951	1-124-222-00	ELECT	22MF	20%	6.3V
C952	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C953	1-136-175-00	FILM	0.68MF	5%	50V
C954	1-124-584-00	ELECT	100MF	20%	10V
C955	1-163-139-00	CERAMIC CHIP	820PF	10%	50V
C956	1-162-637-11	CERAMIC CHIP	0.47MF		16V
C957	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C958	1-123-617-00	ELECT	10MF	20%	16V
C959	1-163-209-00	CERAMIC CHIP	0.0015MF	5%	50V
C960	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C961	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C963	1-124-442-00	ELECT	330MF	20%	6.3V
C964	1-124-587-11	ELECT	220MF	20%	6.3V
C965	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C966	1-163-023-00	CERAMIC CHIP	0.015MF	10%	50V
C967	1-124-255-00	ELECT	1MF	20%	50V
C968	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C969	1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C971	⚠1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C972	⚠1-163-013-00	CERAMIC CHIP	0.0022MF	10%	50V
C973	1-124-971-11	ELECT	3.3MF	20%	63V
C974	1-162-697-11	CERAMIC	0.001MF	20%	1.5KV
C975	1-102-038-00	CERAMIC	0.001MF	99%	500V
C976	1-163-077-00	CERAMIC CHIP	0.1MF		50V
		CONNECTOR			
CN951	*1-566-164-11	PIN, CONNECTOR 2P			
CN952	*1-564-001-11	PIN, CONNECTOR 2P			
CN953	*1-564-001-11	PIN, CONNECTOR 2P			
CN954	*1-566-164-21	PIN, CONNECTOR 2P			
CN955	*1-564-001-11	PIN, CONNECTOR 2P			
		DIODE			
D951	8-719-400-20	DIODE MA152WA			
D952	8-719-801-48	DIODE 1SS193			
D953	8-719-801-45	DIODE 1SS187			
		IC			
IC951	8-759-403-49	IC AN2510S			
		COIL			
L951	⚠1-407-167-XX	MICRO INDUCTOR 68UH			
L952	⚠1-459-683-11	COIL, FERRITE (HLC)			
L953	1-408-962-21	MICRO INDUCTOR 2.2UH			
		TRANSISTOR			
Q951	8-729-100-67	TRANSISTOR 2SC1623-L7			

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
Q952	8-729-162-44	TRANSISTOR 2SB624-BV4	
Q953	8-729-100-67	TRANSISTOR 2SC1623-L6	
Q954	8-729-106-68	TRANSISTOR 2SD1615A-GP	
		RESISTOR	
R951	1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R952	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R953	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R954	1-216-671-11	METAL CHIP 6.8K 0.50% 1/10W	
R955	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R956	⚠1-216-019-00	METAL CHIP 56 5% 1/10W	
R957	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R958	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R959	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R960	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R961	1-216-226-00	METAL CHIP 15K 5% 1/8W	
R962	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R963	1-216-295-00	METAL CHIP 0 5% 1/10W	
R964	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R965	1-216-041-00	METAL CHIP 470 5% 1/10W	
R966	⚠1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R967	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R968	⚠1-216-073-00	METAL CHIP 10K 5% 1/10W	
R970	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R971	1-216-130-11	METAL CHIP 2.4M 5% 1/10W	
R972	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R973	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R974	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R976	1-216-121-00	METAL CHIP 1M 5% 1/10W	
		VARIABLE RESISTOR	
RV951	1-237-431-11	RES, ADJ, CARBON 220	
RV952	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV953	1-230-497-11	RES, ADJ, CARBON 22K	
RV954	1-230-203-00	RES, ADJ, METAL GLAZE 2.2M	
RV955	1-230-203-00	RES, ADJ, METAL GLAZE 2.2M	
		TRANSFORMER	
T951	⚠1-439-396-11	TRANSFORMER ASSY, FLYBACK	

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Ref.No	Part No.	Description	Remark
	*1-620-623-14	LD-5 BOARD ***********	
		DIODE	
D954	8-719-801-26	DIODE TLR223 (TALLY)	

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The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No	Part No.	Description	Remark
	A-7060-961-A	AF-32 BOARD, COMPLETE *********************	
		CAPACITOR	
C001	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C002	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C003	1-124-464-11	ELECT 0.22MF 20% 50V	
C004	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C005	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C006	1-123-622-00	ELECT 22MF 20% 16V	
C007	1-163-117-00	CERAMIC CHIP 0.0001MF 5% 50V	
C008	1-163-141-00	CERAMIC CHIP 0.001MF 5% 50V	
C009	1-123-321-00	ELECT 220MF 20% 16V	
C010	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
		CONNECTOR	
CN001	1-563-587-11	CONNECTOR, FLEXIBLE 10P	
CN002	1-563-108-11	CONNECTOR, FLEXIBLE 5P	
CN003	1-566-936-11	PIN, CONNECTOR 2P	
CN004	1-566-937-11	PIN, CONNECTOR 3P	
		IC	
IC001	9-990-857-01	IC HIM21	
IC002	9-992-551-01	IC 80C 49AU-6691	
IC003	9-990-855-01	IC LAG648	
		TRANSISTOR	
Q001	8-729-103-16	TRANSISTOR 2SC1622A	
Q002	8-729-101-07	TRANSISTOR 2SB798	
		RESISTOR	
R001	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R002	1-216-295-00	METAL CHIP 0 5% 1/10W	
R003	1-216-096-00	METAL CHIP 91K 5% 1/10W	
R004	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R005	1-216-082-00	METAL CHIP 24K 5% 1/10W	
R006	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R007	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R008	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R009	1-216-080-00	METAL CHIP 20K 5% 1/10W	
R010	1-216-041-00	METAL CHIP 470 5% 1/10W	
R011	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R012	1-216-082-00	METAL CHIP 24K 5% 1/10W	
R013	1-216-304-11	METAL CHIP 3.3 5% 1/10W	
R014	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R015	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R016	1-216-045-00	METAL CHIP 680 5% 1/10W	
R017	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
		VARIABLE RESISTOR	
VR001	1-230-287-00	RES, ADJ, METAL GLAZE 10K	
VR002	1-237-485-00	RES, ADJ, METAL GLAZE 220K	
VR003	1-237-579-00	RES, ADJ, METAL GLAZE 1K	
		VIBRATOR	
X001	1-567-470-11	VIBRATOR, CERAMIC 6MHZ	

When indicating parts by reference number, please include the board name.

MISCELLANEOUS
****

Ref.No	Part No.	Description	Remark
	⚠1-464-825-11	CONVERTER UNIT, DC/DC	
	1-535-574-11	TERMINAL, SHAFT GROUND	
	1-542-091-22	MICROPHONE, ELECTRET CONDENSER	
	1-547-242-11	LENS, ZOOM (VCL-1206YH)	
	1-556-824-61	CORD, CONNECTION (WITHPLUG) 8P	
	1-559-324-22	SOCKET (TERMINAL BOARD (B))	
	1-807-238-11	SENSOR, DEW CONDENSATION	
C901	1-161-051-00	CAP, CERAMIC 0.01MF X	
L901	⚠1-451-296-11	DEFLECTION YOKE (BLACK & WHITE)	
M903	⚠1-541-508-11	MOTOR, DC (LOADING)	
M904	3-707-369-01	METER ASSY, EE (IRIS)	
M905	1-541-536-11	MOTOR ASSY, AF	
M906	1-541-537-11	MOTOR ASSY, ZOOM	
S901	1-554-944-41	SWITCH, PUSH (ZOOM)	
S902	1-553-226-00	SWITCH, LEAF (CC DOWN)	
V901	⚠1-546-061-11	CATHODE-RAY TUBE, B/W	

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
3-712-595-11	BELT, SHOULDER	
*3-718-294-01	CUSHION (UPPER)	
*3-718-295-01	CUSHION (LOWER)	
*3-719-812-11	CARTON, OUTER	
*3-764-631-12	INSTRUCTION, DEW CONDENSATION	
3-769-231-22	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH: CCD-V5)	
3-761-231-61	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH: CCD-V50)	

ACCESSORY KIT

Part No.	Description	Remark
A-6767-225-A	MODURATOR ASSY	

****

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

SECTION 7
CAMERA SECTION ADJUSTMENT

During the adjustment see the parts location diagram relevant to the adjustment on page 240.

PREPARATION BEFORE ADJUSTMENT (CAMERA SECTION)

7-1. LIST OF SERVICING JIGS

●Oscilloscope ●AC pack ●Screwdriver ●L wrench ●Stop watch ●Color monitor TV ●Vectorscope

Ref No.		Name	Part Code	Use
J-1		Filter (C22)	J-6080-829-A	R gain and B gain adjustment
J-2		ND filter 0.4	J-6080-806-A	IRIS set adjustment, MAX gain adjustment, LLA adjustment
		ND filter 0.1	J-6080-807-A	IRIS set adjustment, LLA adjustment
		ND filter 0.9	J-6080-833-A	MAX gain adjustment, LLA adjustment
J-3		Pattern box PTB-500*¹	J-6029-140-A	
J-4		Pattern box color chart	J-6020-250-A	
J-5	a	Flat cable C (flexible cable of 7P)	J-6080-874-A	
	b	Extension board	J-6080-868-A	
J-6		Extension cable (7P)	J-6080-869-A	
		Extension cable (4P)	J-6080-871-A	
		Extension cable (3P)	J-6080-872-A	
J-7		Lens block fixing jig	J-6094-894-A	
J-8		Siemens-star	J-6080-875-A	Flange back adjustment

*¹ The PTB-100 (J-6020-490-A) can also be used.

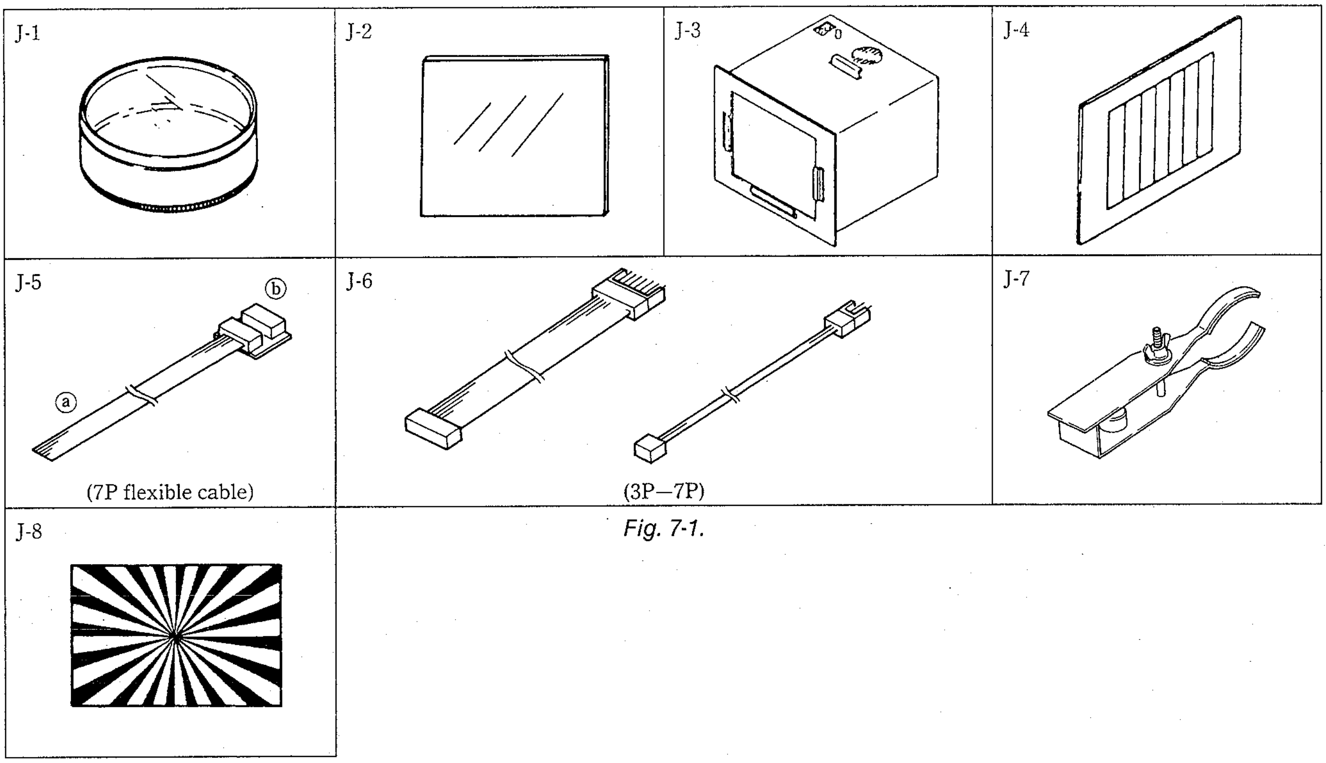


Fig. 7-1.

7-2. PREPARATION

Note:

Refer to SECTION 2. DISASSEMBLY as to details for remove the cabinets and boards.

1) Remove the front cabinet, rear cabinet, cabinet (R) and cabinet (L).
2) Separate the camera section and video section from each other.
3) Open the camera board in the manner mentioned in 2. DISASSEMBLY OPENING THE CAMERA BOARD.
4) Connect the extension cable as shown in Fig. 7-3.
5) Connect the EVF (Electronic View Finder) to CN207 of the MV-11 board because it is required for adjusting and checking the following parts:
   1) Camera DC-DC converter voltage check
   2) EVF section adjustment

   Adjustments and checks other than those above can be performed on the monitor screen.

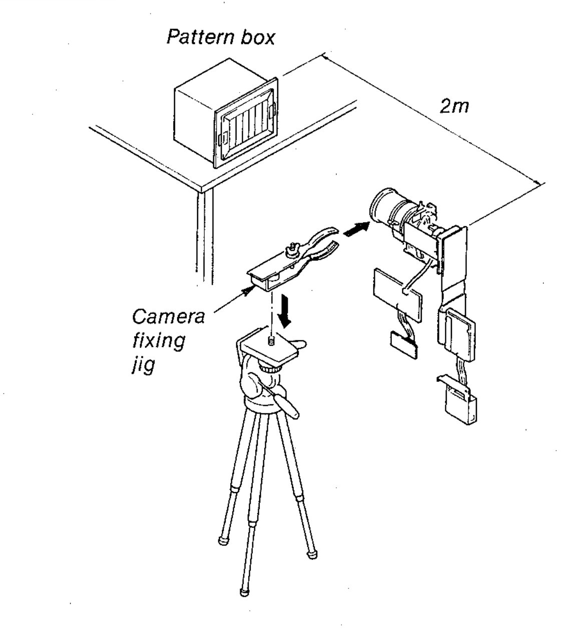
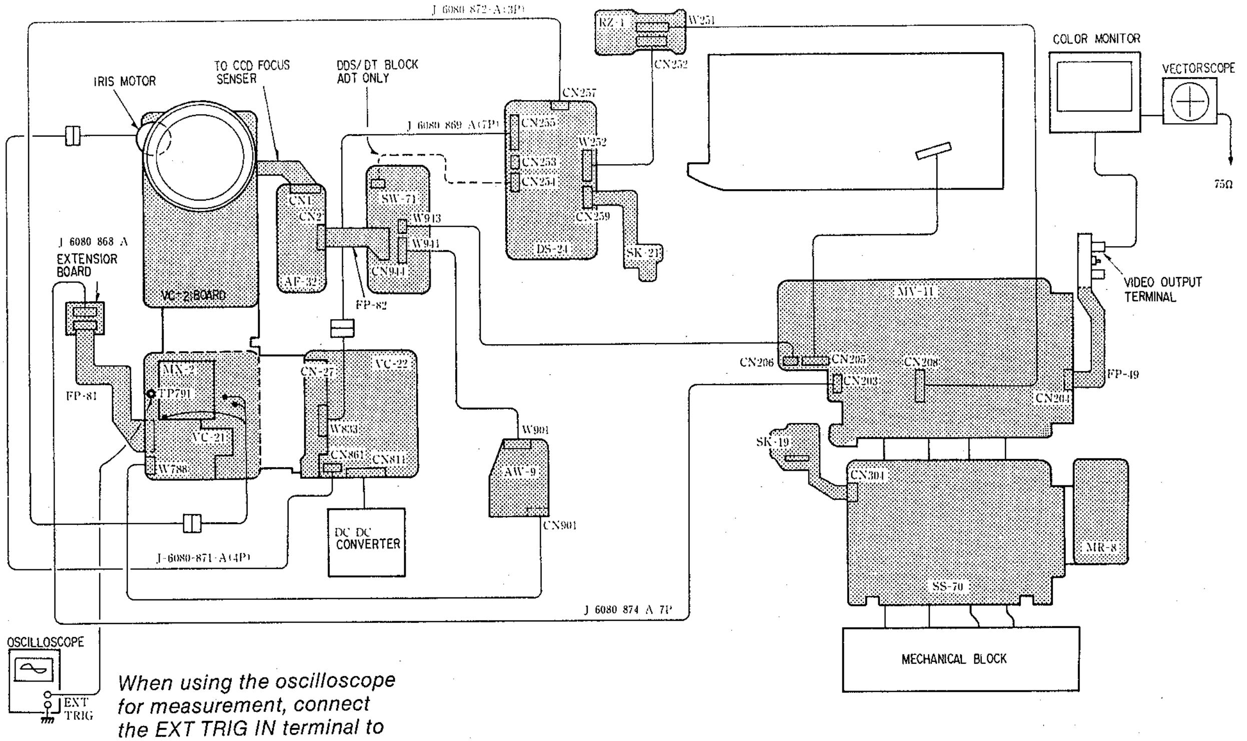

Pattern box
2m
Camera fixing jig

Fig. 7-2.


J 6080 872-A(3P)
RZ-1
W251
CN252
COLOR MONITOR
VECTORSCOPE
75Ω
IRIS MOTOR
TO CCD FOCUS SENSER
DDS/DT BLOCK ADT ONLY
CN257
J 6080 869 A(7P)
CN255
W252
CN253
CN254
CN259
DS-24
SK-21
CN1
CN2
AF-32
SW-71
W913
W941
CN944
FP-82
VC-21BOARD
J 6080 868 A
EXTENSION BOARD
FP-81
MX-2
TP791
VC-21
W788
CN-27
VC-22
W833
CN861
CN811
W901
AW-9
CN901
DC DC CONVERTER
J-6080-871-A(4P)
J 6080 874 A 7P
MV-11
VIDEO OUTPUT TERMINAL
CN206
CN205
CN208
CN203
FP-49
CN204
SK-19
CN304
MR-8
SS-70
MECHANICAL BLOCK
OSCILLOSCOPE
EXT TRIG

When using the oscilloscope for measurement, connect the EXT TRIG IN terminal to TP791 (ID) of the VC-21 board to obtain synchronism, unless otherwise specified.

Fig. 7-3.

7-3. PRECAUTIONS

1) Setting the switches
   Adjust the switches to the following positions, when not specified:
   1. Set the FOCUS switch (SW-71 board, S945) to MANUAL
   2. Set the WHITE BALANCE switch (SW-71 board, S941) to INDOOR (☼)

2) Adjustment Procedure
   As a rule, adjust in a described order.

3) Subject
   1. Color bar chart (standard picture frame)
      Adjust the picture frame as shown in Fig. 7-4. When using a color chart for adjustment. (Standard picture frame).

Color Bar Chart Standard Picture Frame

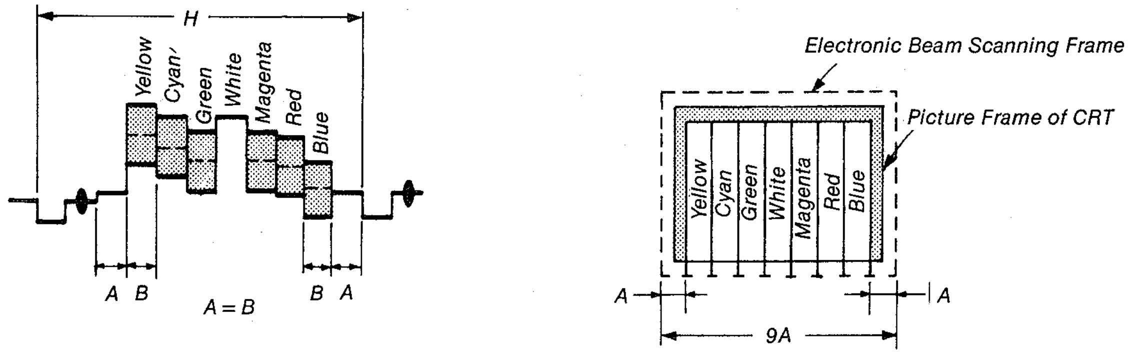

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
Electronic Beam Scanning Frame
Picture Frame of CRT
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
A
9A

Fig. a (Camera Output Waveform of No. ⑦ terminal of FP-81 Board)

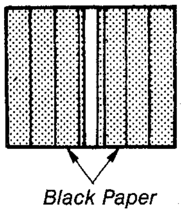
Fig. b (Picture of Monitor TV screen)

Adjust camera zooming and its direction so that the output waveform in Fig. a and the picture in Fig. b can be obtained.

Fig. 7-4.

2. Full white pattern
   Remove the color bar chart from the pattern box and shift the zoom lever fully to the TELE (72mm) side.
3. High brightness pattern
   Create a high brightness pattern as shown in Fig. 7-5, and adjust the picture frame as shown in Fig. 7-6.
4. Siemens star (J-6080-875-A)
   Adjust a camera direction so that a siemens star center will coincide with a monitor screen center on the monitor TV screen.

High Brightness Pattern


Black Paper

Leaving only a half of color bar chart's white width intact, cover the rest with black paper, and take a picture with the standard picture frame.

Fig. 7-5.

High Brightness Pattern

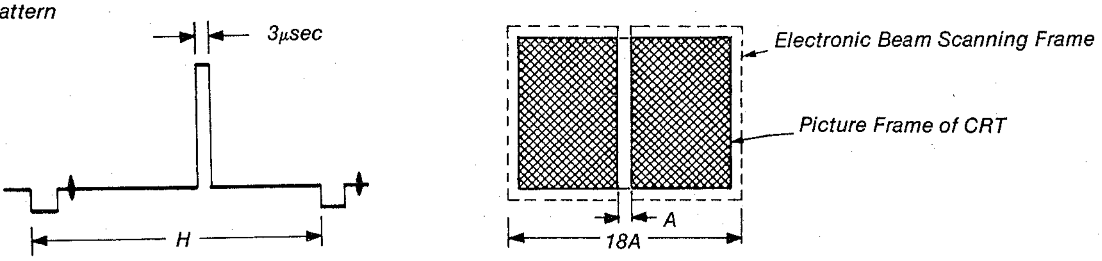

3μsec
H
Electronic Beam Scanning Frame
Picture Frame of CRT
A
18A

Fig. a (Camera Output Waveform of No. ⑦ terminal of FP-81 Board)

Fig. b (Picture of Monitor TV Screen)

Adjust camera zooming and its direction so that the output waveform in Fig. a and the picture in Fig. b can be obtained.

Fig. 7-6.

7-4. CAMERA SYSTEM ADJUSTMENT

7-4-1. Flange Back Adjustment

Subject	Siemens star at a distance of 2m in the front of a lens datum level (marked with ϕ)
Measurement point	Confirm with the monitor TV.
Measurement equipment	
Adjustment element	Flange back adjustment pin
Tools	L wrench (1.5mm), regular screwdriver

[Adjustment Method]

1) Set the FOCUS switch (SW-71 board, S945) to a MANUAL position.
2) Place the Siemens star at a distance of 2m in the front of the lens datum level (see Fig. 7-2).
3) Adjust the position of the camera section so that the center of the Siemens star displayed on the monitor screen will coincide with the center of the monitor screen.
4) Check that the lens zoom lever can be rotated fully to WIDE (12mm) and TELE (72mm), and rotate fully to the WIDE side. (Also check that the monitor screen is zooming.)
5) Push the BACK LIGHT button to set up BACK LIGHT mode and open iris.
6) Set the lens focus ring index to the center, "2".

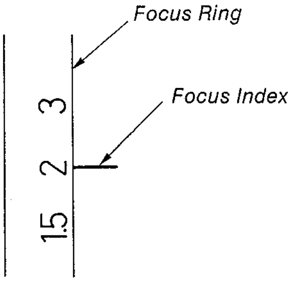
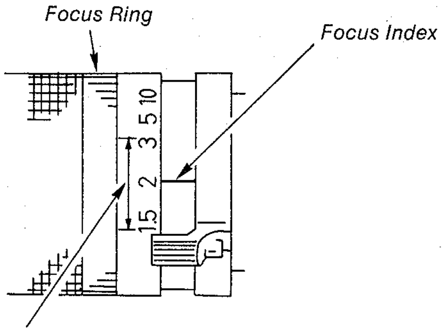


Fig. 7-7.

7) Loosen the hexagon socket head setscrew ❶. (See Fig. 7-9)
8) Viewing the monitor screen, turn the flange back adjustment pin ❷ to make clearest the wedge at the center of the Siemens star on the screen. (Confirm that it is clearest, by turning the pin 2 or 3 times to the right and left.)

   Note:

   Do not turn the adjustment pin too much in one direction.
9) Securely hold the flange back adjusting pin ❷ to prevent it from being rotated, tighten the hexagon socket head setscrew ❶.
10) Set the zoom lever fully to side and rotate the focus ring. Be sure that the position in which the wedge becomes most clear is within a range shown in Fig. 7-8.



The focus index should be within this range.

Fig. 7-8.

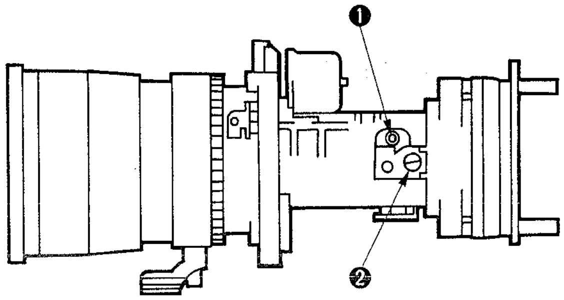


Fig. 7-9.

11) Set zoom lever to end of TELE.
12) Turn the focus ring and stop at the position where the wedge becomes most clear. Confirm then that the focus indicator is within ±1.5mm of "2".

7-4-2. Camera DC-DC Converter Voltage Check (VC-22 Board)

Measurement equipment	Digital voltmeter
5V check	
Specified value	5.05 ± 0.1V
Measurement Point	Pin ⑧ of CN881
8.5V check	
Specified value	8.5 ± 0.15V
Measurement Point	Pin ⑦ of CN881
12V check	
Specified value	12.0 ± 0.3V
Measurement Point	Pin ⑤ of CN881
20V check	
Specified value	20 ± 0.5V
Measurement Point	Pin ④ of CN881

Note:

Check with the EVF section connected.

[Confirmation Method]

1) Each supply voltage should satisfy its specified value.

7-4-3. Clock Oscillation Frequency Adjustment (VC-20 and DT-61 Boards)

Measurement Point	Pin ㊱ (CL) of the DT-61 board
Measurement equipment	Frequency counter
Adjustment element	CT721 of VC-20 board
Specified value	14318181 ± 72Hz

[Adjustment Method]

1) Adjust to 14318181 ± 72Hz with CT721.

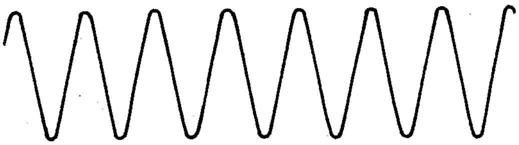


Fig. 7-10.

7-4-4. Iris Set Adjustment (VC-20 and IA-1/VC-22 Boards)

Subject	Color bar chart standard picture frame
Filter	ND filters 0.4 and 0.1
Measurement point	TP751 (CCD OUT) of the VC-20 board
Measurement equipment	Oscilloscope
Adjustment element	RV722 (IRIS SET) of the IA-1 board
Specified value	250 ± 5mV

[Adjustment Method]

1) With no ND filter attached, adjust a signal level to 250 ± 5mV using RV722 of the IA-1 board.
   (Be sure to complete adjustment by turning RV722 in the direction which reduces the signal level.)
2) Attach the ND filter 0.5 (0.4 + 0.1) to the front of the lens, and confirm that the signal level changes smoothly.
3) Detach the ND filter, and confirm that the signal level is 250 ± 5mV.
4) When the specified value is not satisfied, repeat the above-mentioned steps 1) through 3).

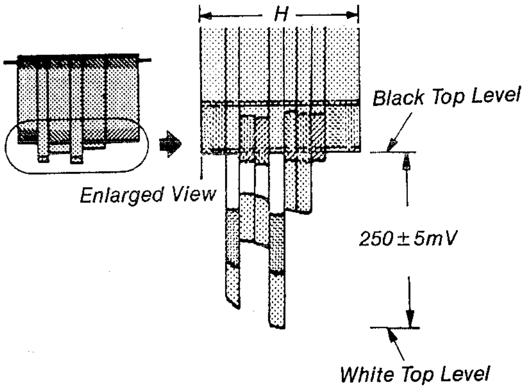


Fig. 7-11.

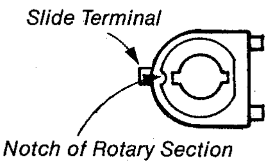
7-4-5. AGC Set Adjustment (SH-2/VC-20 and IA-1 Boards)

Subject	Color bar chart standard picture frame
Measurement point	TP752 (G DET) of the VC-20 board
Measurement equipment	Oscilloscope (GND: TP753 of the VC-20 board)
Adjustment element	RV721 (AGC SET) of the IA-1 board
Specified value	250 ± 5mV

Note:

Set to the mechanical center the following 3 RVs of the SH-2 board:

1. RV006 (R GAIN)
2. RV007 (B GAIN)
3. RV008 (MAX GAIN)



Mechanical center: The round notch of the RV's rotary section should conform to a position of the slide terminal.

Fig. 7-12.

[Adjustment Method]

1) Adjust a signal level to 250 ± 5mV with RV721 of the IA-1 board.

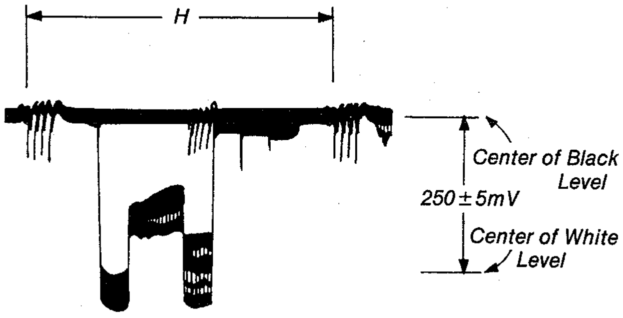

H
Center of Black Level
250 ± 5mV
Center of White Level

Fig. 7-13.

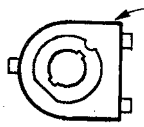
7-4-6. G Pedestal Adjustment (1) (VC-21, SH-2/VC-20 Boards)

Subject	All black (Cover a black cap on the lens.)
Measurement point	TP781 (G – r) of the VC-21 board
Measurement equipment	Oscilloscope
Adjustment element	RV001 (G-PEDESTAL) of the SH-2 board
Specified value	50 ± 5mV

Note:

Rotate fully the following 2 RVs of the SH-2 board in the clockwise direction:

1. RV002 (WHITE CLIP(I))
2. RV003 (GAMMA)



State of full clockwise direction: The round notch of the rotary section should be located at this position.

Fig. 7-14.

[Adjustment Method]

1) Adjust a pedestal level to 50 ± 5mV with RV001 of the SH-2 board.

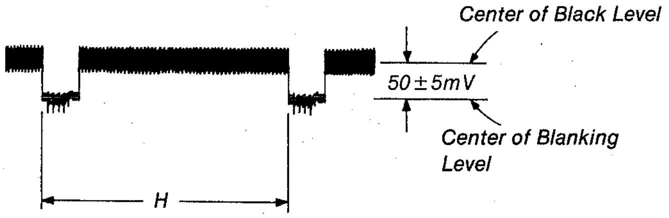

Center of Black Level
50 ± 5mV
Center of Blanking Level
H

Fig. 7-15.

7-4-7. G-γ Adjustment (VC-21 and SH-2/VC-20 Boards)

Subject	Color bar chart standard picture frame
Measurement point	TP781 (G – γ) of the VC-21 board
Measurement equipment	Oscilloscope
Adjustment element	RV003 of the SH-2 board
Specified value	380 ± 10mV

[Adjustment Method]

1) Adjust to 380 ± 10mV with RV003 of the SH-2 board.

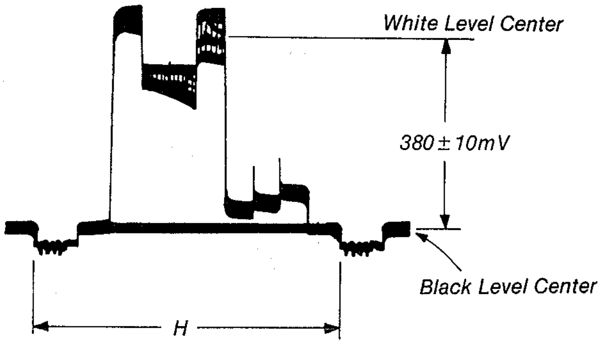

White Level Center
380 ± 10mV
Black Level Center
H

Fig. 7-16.

7-4-8. White Clip Adjustment (1) (VC-21 and SH-2/VC-20 Boards)

Subject	High brightness pattern
Measurement Point	TP781 (G – γ) of the VC-21 board
Measurement equipment	Oscilloscope
Adjustment element	RV002 (WHITE CLIP (1)) of the SH-2 board
Specified value	520 ± 10mV

[Adjustment Method]

1) Adjust a white peak level to 520 ± 10mV with RV002 of the SH-2 board.

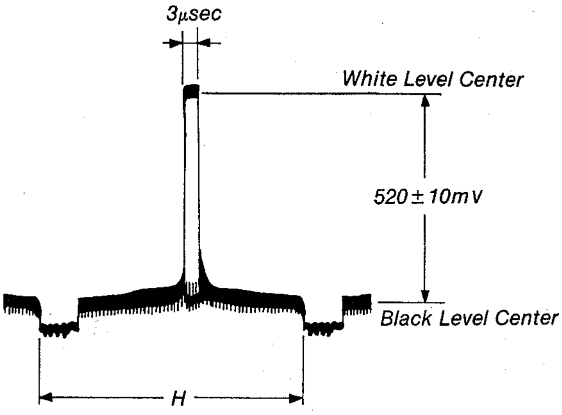

3μsec
White Level Center
520 ± 10mV
Black Level Center
H

Fig. 7-17.

7-4-9. G Pedestal Adjustment (2) (VC-21 and SH-2/VC-20 Boards)

Subject	All black (Cover a black cap on a lens.)
Measurement point	TP781 (G − γ) of the VC-21 board
Measurement equipment	Oscilloscope
Adjustment element	RV001 of the SH-2 board
Specified value	25 ± 5mV

[Adjustment Method]

1) Adjust to 25 ± 5mV with RV001 of the SH-2 board.

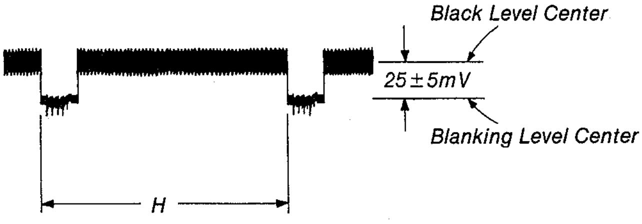

Black Level Center
25 ± 5mV
Blanking Level Center
H

Fig. 7-18.

7-4-10. G-γ Level Check (VC-21 and SH-2/VC-20 Boards)

Subject	Color bar chart standard picture frame
Measurement point	TP781 (G − γ) of the VC-21 board
Measurement equipment	Oscilloscope
Adjustment element	RV002 of the SH-2 board
Specified value	370 ± 15mV

[Checking Method]

1) Check that the white level is 370 ± 15mV.
2) When the specified value is not, Use RV002 of the SH-2 board to meet it if the specified value is not satisfactory.

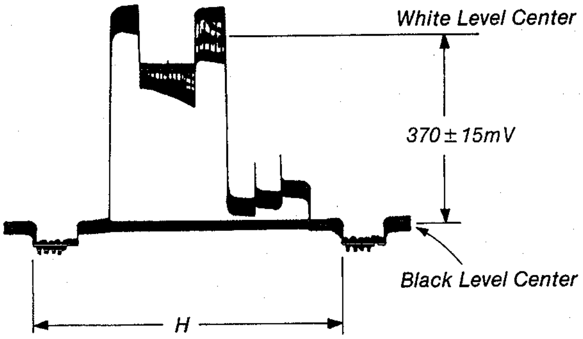

White Level Center
370 ± 15mV
Black Level Center
H

Fig. 7-19.

7-4-11. RB Offset Adjustment (VC-21 and SH-2/VC-20 Boards)

Subject	Full black (Cover the lens with a black cap.)
Measurement point	CH1: TP781 (G − γ) of the VC-21 board CH2: TP782 (RB − γ) of the VC-21 board
Measurement equipment	Oscilloscope (Vertical mode: ADD CH2 polarity: INVERT)
Adjustment element	RV005 (R, OFF SET) of the SH-2 board RV004 (B, OFF SET) of the SH-2 board
Specified value	The blanking level should be at the center of a noise width.

[Adjustment Method]

1) Adjust the blanking level to the center of the noise width with RV005 and RV004 of the SH-2 board.

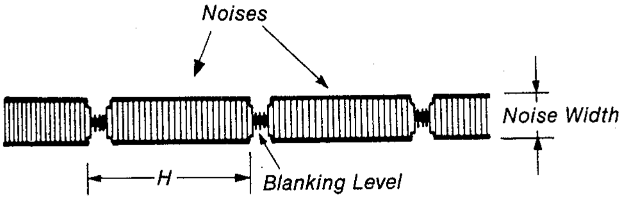

Noises
Noise Width
H
Blanking Level

Fig. 7-20.

7-4-12. White Balance Adjustment (VC-21 and SH-2/VC-20 Boards)

Subject	Color bar standard picture frame
Measurement point	CH1 (X): Pin ④ of CN255 (B − Y) on the DS-24 board CH2 (Y): Pin ⑤ of CN255 (R − Y) on the DS-24 board
Measurement equipment	Oscilloscope (X − Y mode) GND: Pin ⑥ of CN255 on the DS-24 board
Adjustment element	RV006 (R GAIN) and RV007 (B GAIN) of the SH-2 board
Specified value	The white and black bright points should coincide with each other in location.

[Adjustment Method]

1) By turning RV006 and RV007 of the SH-2 board have the white bright point coincide with the black bright point in location.

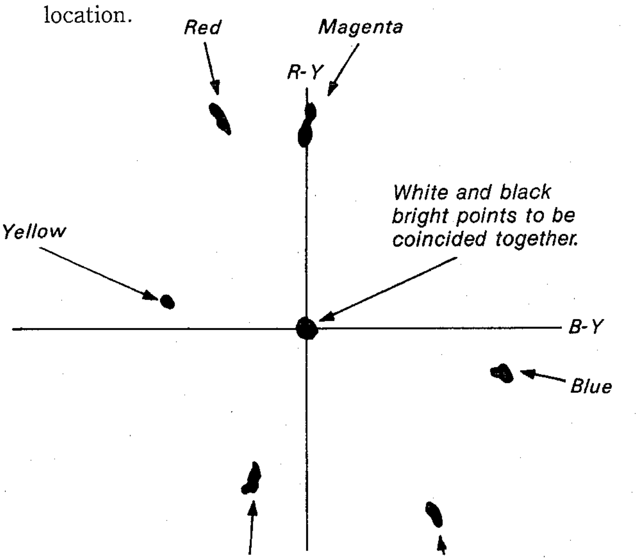

Red
Magenta
R-Y
White and black bright points to be coincided together.
Yellow
B-Y
Blue
Green
Cyan

Fig. 7-21.

7-4-13. MPX Adjustment (MX-2/VC-21 Boards)

Subject	All black (Cover a black cap on the lens)
Measurement point	CH1 (X): Pin ④ of CN255 (B − Y) on the DS-24 board CH2 (Y): Pin ⑤ of CN255 (R − Y) on the DS-24 board
Measurement equipment	Oscilloscope (X − Y mode)
Adjustment element	RV825 of the MX-2 board
Specified value	There should be only one black bright point whose size is minimum.

[Adjustment Method]

1) Adjust the black spots to one with RV825 of the MX-2 board.

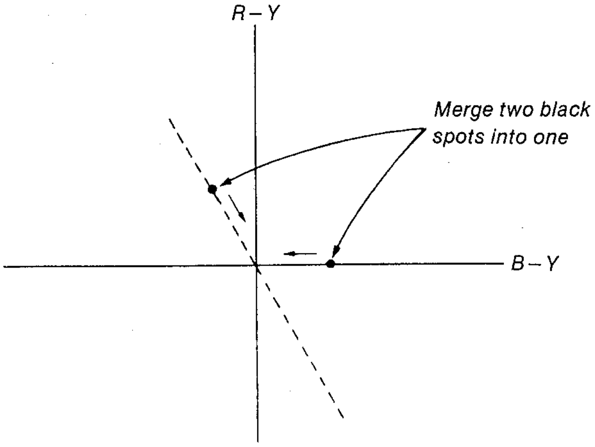


Fig. 7-22.

7-4-14. Carrier Balance Adjustment (VC-22 Board)

Subject	Color bar chart standard picture frame
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV804 (CB0°), RV803 (CB90°)
Specified value	The 3.58MHz component of a black part should be minimum.

[Adjustment Method]

1) Minimize the amplitude of the black part with RV804 and RV803.

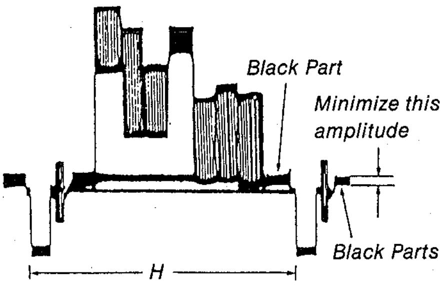
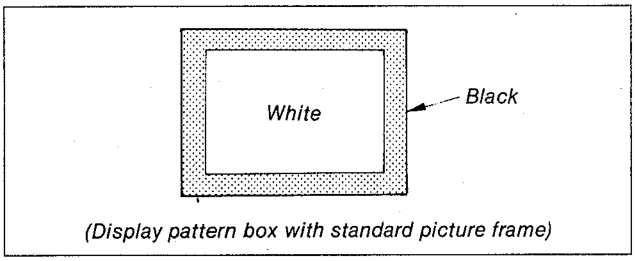


Fig. 7-23.

7-4-15. Matrix Gain Adjustment (MX-2/VC-21 Boards)

Subject	White pattern (Include a black frame. See Fig. 7-24.)
Measurement equipment	Oscilloscope Vertical mode: ADD CH2 polarity: INVERT
G1 gain adjustment	
Measurement point	CH1: TP783 (G0) of the VC-21 board CH2: TP784 (G1) of the VC-21 board
Adjustment element	RV821 (G1) of the MX-2 board
Specified value	There should be no difference in level between white and black parts.
G2 gain adjustment	
Measurement point	CH1: TP783 (G0) of the VC-21 board CH2: TP785 (G2) of the VC-21 board
Adjustment element	RV823 (G2) of the MX-2 board
Specified value	There should be no difference in level between white and black parts.
RB1 gain adjustment	
Measurement point	CH1: TP788 (RB0) of the VC-21 board CH2: TP787 (RB1) of the VC-21 board
Adjustment elements	RV822 (RB1) of the MX-2 board
Specified value	There should be no difference level between white and black parts.
RB2 gain adjustment	
Measurement point	CH1: TP788 (RB0) of the VC-21 board CH2: TP786 (RB2) of the VC-21 board
Adjustment element	RV824 (RB2) of the MX-2 board
Specified value	There should be no difference in level between white and black parts.



(Display pattern box with standard picture frame)

Fig. 7-24.

[Adjustment Method]

1) Eliminate differences in level between white and black parts with each RV.

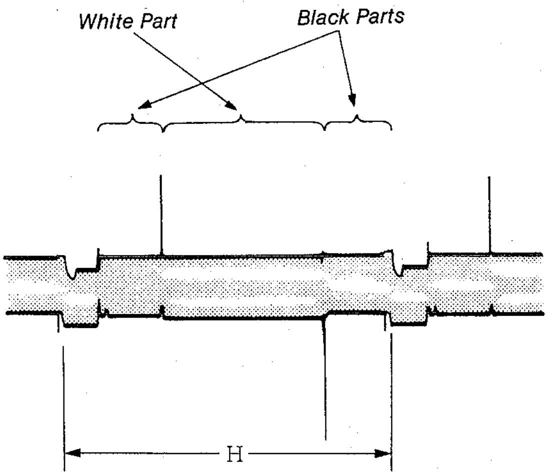


Fig. 7-25.

Note:

After adjustment, confirm the MPX adjustment and carrier balance adjustment. When each specified value is not met, make readjustment.

7-4-16. Set up Adjustment (VC-22, CN-27 Boards)

Subject	All black (Cover a black cap on the lens)
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV807 (PED) on the CN-27 board
Specified value	30 ± 5mV

[Adjustment Method]

1) Adjust a setup level to 30 ± 5mV with RV807 on the CN-27 board.

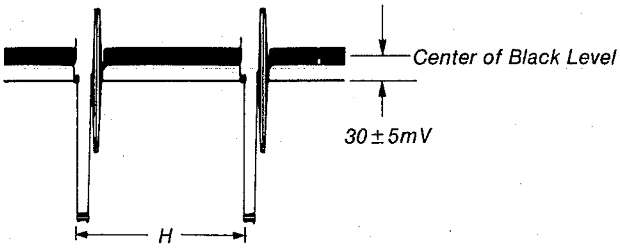


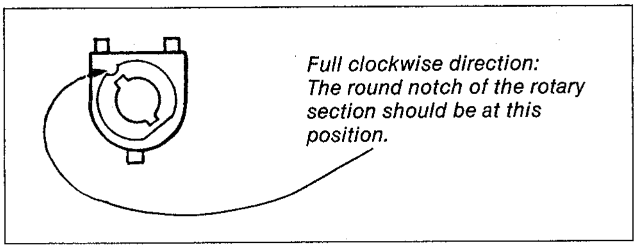
Fig. 7-26.

7-4-17. Y Level Adjustment (VC-22 Board)

Subject	Color bar chart (Standard picture frame)
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV809 (YG)
Specified value	360±10mV

Note:

Turn RV810 (WC2) fully in the clockwise direction to maximize the signal level of TP803.



Full clockwise direction: The round notch of the rotary section should be at this position.

Fig. 7-27.

[Adjustment Method]

1) Adjust the Y level to 360±10mV with RV809.

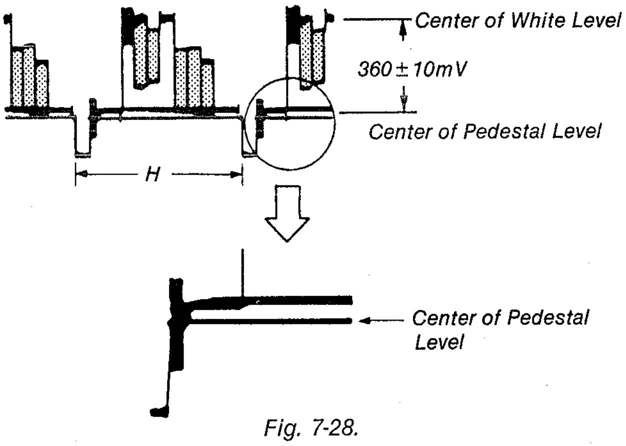


Fig. 7-28.

Note:

After adjustment, check the SET UP adjustment. When the specified value is not met, make readjustment.

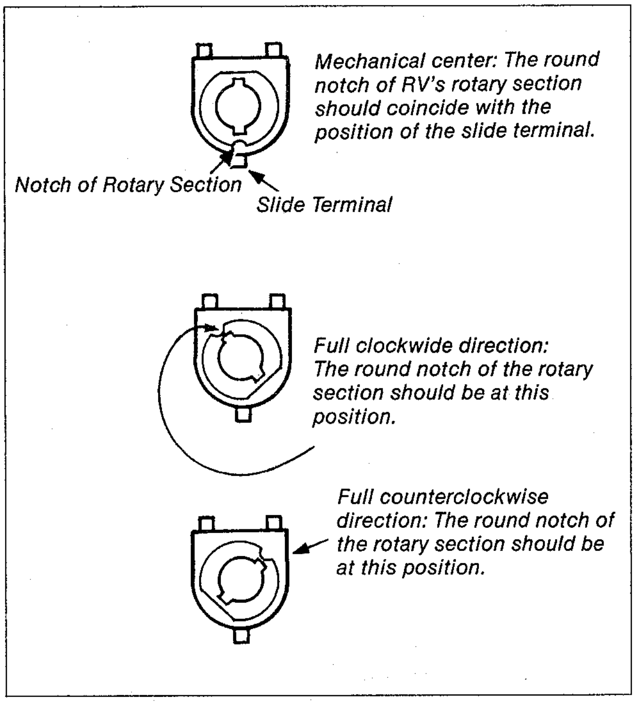
7-4-18. Aperture Adjustment (VC-22 and IA-1/VC-22 Boards)

Subject	Colour bar chart standard picture frame
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV802 (APS) and RV801 (APL) of the VC-22 board
Specified value	RV802: Aperture level at 135±5mVp-p RV801: Aperture level at 90±5mVp-p

Note 1:

Preset the following RVs:

1. RV802 (APS) of the VC-22 board . . . Mechanical center
2. RV801 (APL) of the VC-22 board . . . Fully in the clockwise direction (↻).
3. RV810 (WHITE CLIP (2)) of the VC-22 board . . . Fully in the clockwise direction (↻).
4. RV723 (LLA) of the IA-1 Board . . . Fully in the counter clockwise direction (↺).



Mechanical center: The round notch of RV's rotary section should coincide with the position of the slide terminal.

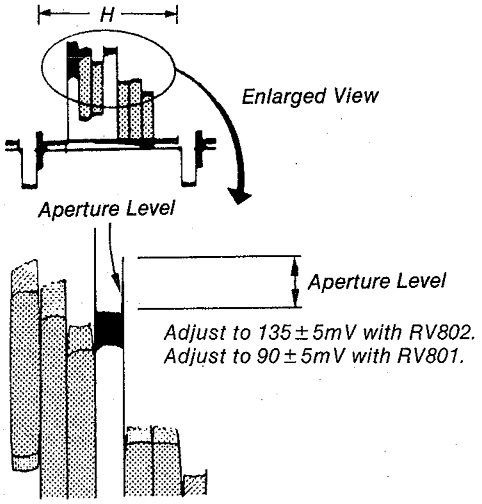
Full clockwide direction: The round notch of the rotary section should be at this position.

Full counterclockwise direction: The round notch of the rotary section should be at this position.

Fig. 7-29.

[Adjustment Method]

1) After focusing, swing the camera section slightly to the right and left and fix it at the point where an aperture level between white and magenta (see Fig. 7-30) is maximized.
2) Adjust the aperture level to 135±5mV with RV802 of the VC-22 board.
3) Adjust the aperture level to 90±5mV with RV801 of the VC-22 board.



Adjust to 135±5mV with RV802.
Adjust to 90±5mV with RV801.

Fig. 7-30.

Note 2:

Re-adjust the RV810 and RV723 being preset in 'Note 1', following each item of adjustment.

7-4-19. White Clip Adjustment (2) (VC-22 Board)

Subject	High brightness pattern
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV810 (WHITE CLIP (2))
Specified value	420 ± 10mV

[Adjustment Method]

1) Adjust a signal level to 420 ± 10mV with RV810.

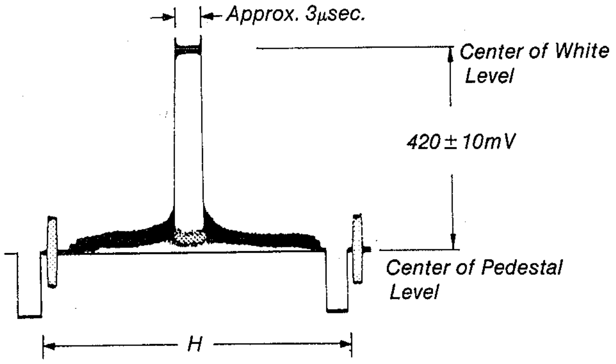

Approx. 3μsec.
Center of White Level
420 ± 10mV
Center of Pedestal Level
H

Fig. 7-31.

7-4-20. Max. Gain Adjustment (VC-22 and SH-2/VC-20 Boards)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.9, 0.4... 2 pcs.
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV008 (MAX GAIN) of the SH-2 board
Specified value	180 ± 5mV

[Adjustment Method]

1) Cover an ND filter 1.7 (0.9 + 0.4 + 0.4) in front of the lens.
2) Adjust to 180 ± 5mV with RV008 of the SH-2 board.

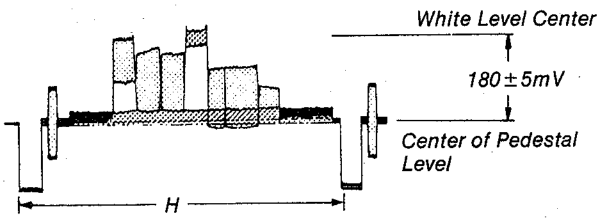

White Level Center
180 ± 5mV
Center of Pedestal Level
H

Fig. 7-32.

7-4-21. AGC Set Confirmation/Adjustment (VC-20 and IA-1/VC-22 Boards)

Subject	Color bar chart standard picture frame
Measurement point	TP752 (G DET) of the VC-20 board
Measurement equipment	Oscilloscope (GND: TP753 of the VC-20 board)
Adjustment element	RV721 (AGC SET) of the IA-1 board
Specified value	250 ± 15mV

[Confirmation Method]

1) Check that a signal level is 250 ± 15mV.
2) When the specified value is not met, adjust to 250 ± 15mV with RV721 of the IA-1 board.

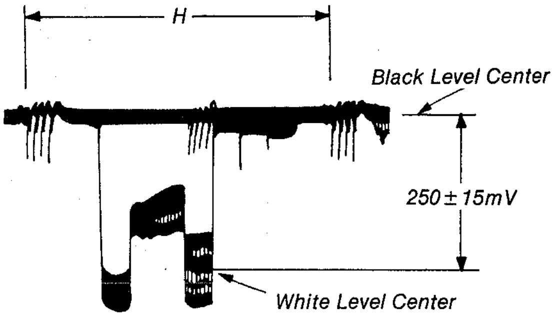

H
Black Level Center
250 ± 15mV
White Level Center

Fig. 7-33.

Note:

After adjustment, check the White Balance adjustment. If each specified value is not met, make readjustment.

7-4-22. Burst Phase and Burst Level Adjustment (VC-22 Board)

Subject	Colour bar chart standard picture frame
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope Trigger slope: +
Adjustment element	RV806 (HUE) and RV805 (BURST GAIN) of the VC-22 board
Specified value	(Burst phase) should become a single line. (Burst level) 140 ± 5mVp-p

Note: When performing colour reproductivity adjustment with a vectorscope, this adjustment becomes unnecessary.

[Adjustment Method]

1) Turn RV805 so that the burst amplitude becomes 140 ± 5mVp-p.

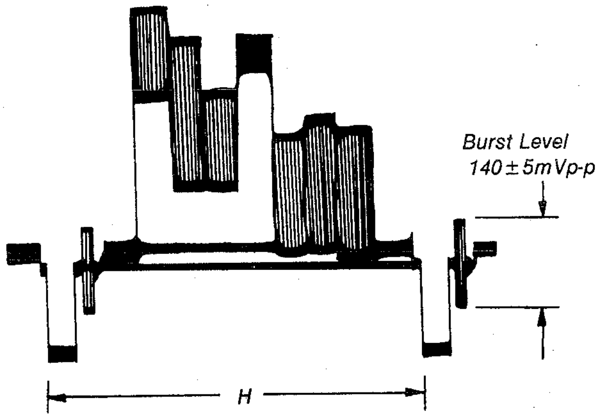


Fig. 7-34

7-4-23. Color Reproducibility Adjustment (Use a Vectorscope) (MX-2, VC-21 and VC-22 Boards)

Subject	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal
Measurement equipment	Vectorscope
Adjustment element	RV827 of the MX-2 board (B − Y GAIN) RV781 of the VC-21 board (B − Y MIX) RV808 of the VC-22 board (R − Y MIX) RV806 of the VC-22 board (HUE)
Specified value	Each color bright point should be within a color reproduction frame. (See Fig. 7-35)

Note:

Before this adjustment confirm that a burst bright point is at a specified position, and that a white bright point coincides with an origin. (When the white bright point and the origin do not coincide with each other, carry out white balance adjustment (RV006 and RV007 of the SH-2 board) and carrier balance adjustment (RV803 and RV804 of the VC-22 board).)

[Adjustment Method]

1) Place a "red" bright point within the color reproduction frame with RV806 and RV808 of the VC-22 board.
2) Place a "yellow" bright point within the color reproduction frame with RV827 of the MX-2 board and RV781 of the VC-21 board.
3) Place each color bright point within the color reproduction frame, repeating the above-mentioned steps 1) and 2).
4) Place the white balance switch (S941 of the SW-71) board) outside (☀).
5) Check that the 'white' brightness point moves into outside color reproduction. (See Fig. 7-35)

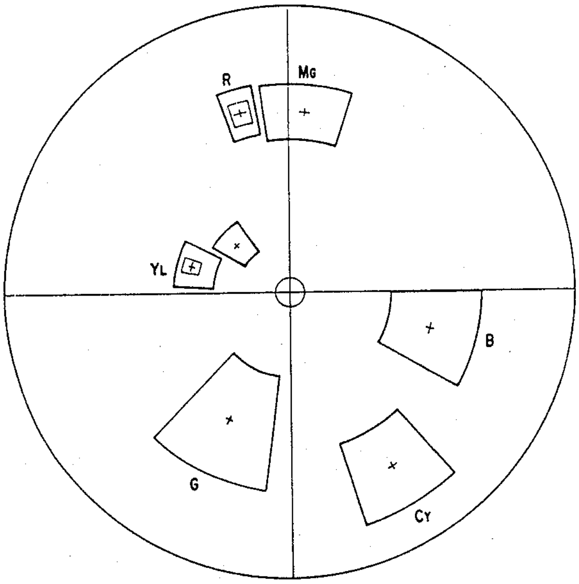


Fig. 7-35.

7-4-24. Color Reproducibility Adjustment (Use a Oscilloscope)

A. Gain Adjustment (MX-2/VC-21 and VC-22 Boards)

Subject	Color bar chart standard picture frame
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope
Adjustment element	RV827 (B−Y GAIN) of the MX-2 board RV808 (CHROMA GAIN) of the VC-22 board
Specified value	"Magenta" level: 235±5mVp-p "Yellow" level: 131±5mVp-p

[Adjustment Method]

1) Set RV781 (B−Y MIX) and RV782 (R−Y MIX) of the VC-21 board to the mechanical center.
2) Adjust an amplitude of "magenta" to 235±5mVp-p with RV808 of the VC-22 board. (See Fig. 7-36 ①)
3) Adjust an amplitude of "yellow" to 131±5mVp-p with RV827 of the MX-2 board. (See Fig. 7-36 ②)

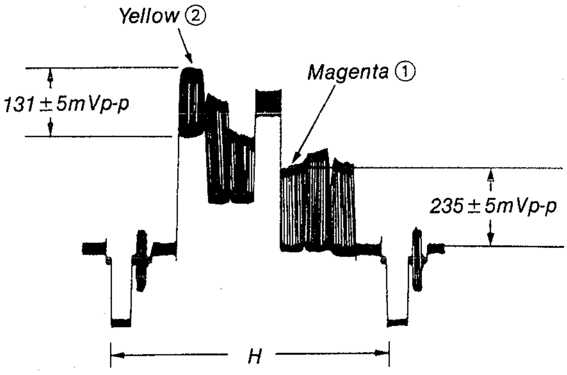
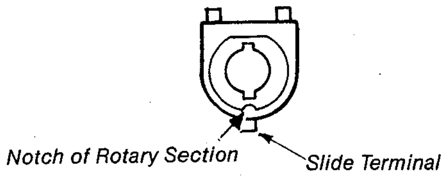


Fig. 7-36.



Mechanical center: The round notch of the RV's rotary section should coincide with the position of the slide terminal.

Fig.7-37

B. Hue Adjustment (VC-21, VC-22 and SH-2 Boards)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X): Pin ④ of CN255 (B−Y) on the DS-24 board CH2 (Y): Pin ⑤ of CN255 (R−Y) on the DS-24 board
Measurement equipment	Oscilloscope (X−Y mode) GND: Pin ⑥ of CN255 on the DS-24 board *Paste a color reproduction frame for oscilloscope.
Adjustment element	RV781 (B−Y MIX) of the VC-21 board RV806 (HUE) of the VC-22 board
Specified value	Each color bright point should be within the color reproduction frame. (See Fig. 7-38)

[Adjustment Method]

1) Coincide a "black" spot on the oscilloscope with the origin of the color reproduction frame.
2) Check that a "white" bright point and a "black" bright point coincide with each other. (If they are not coincident, make white balance adjustment (RV006 and RV007 of the SH-2 board).)
3) Place a "red" bright point and a "yellow" bright point within the color reproduction frame with RV781 of the VC-21 board. (Check that each of other color bright points is located within the color reproduction frame.)
4) Set RV806 of the VC-22 board to the mechanical center (see Fig. 7-35).
5) Confirm colors reproduced on the monitor screen. Finely adjust RV806, if necessary.
   Notes: 1. Hue adjustment of the monitor TV should be already finished.
   2. "Magenta" is reproduced reddish.
6) Place the white balance switch (S941 of SW-71 board) outside (☀).
7) Check that the white brightness point moves to the place between 'red' and 'yellow' standard frame.

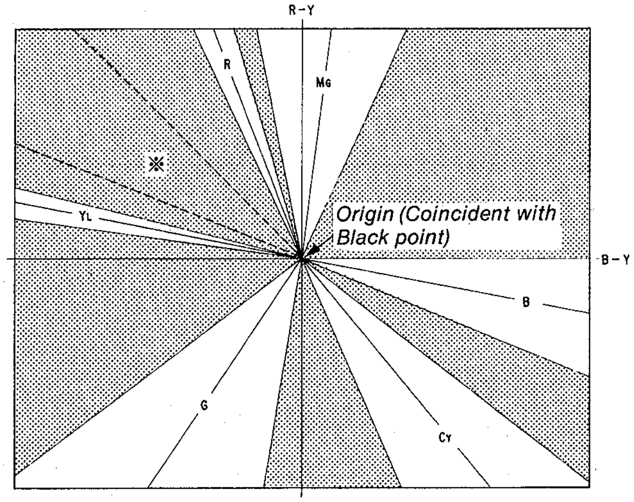


Fig. 7-38.

: Movable range of the white bright point under the condition that the white balance switch is turned into 'Outdoor' position.

7-4-25. LLA Adjustment (IA-1/VC-22 Boards)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.9 . . . 1 pc. ND filter 1.0 . . . 1 pc. ND filter 0.4 . . . 1 pc.
Measurement point	Pin ⑤ of IA-1 board ($\overline{\text{LLA}}$)
Measurement equipment	Oscilloscope (DC range)
Adjustment element	RV723 (LLA)
Specified value	"LOW LIGHT" should be displayed with the ND filter 1.4, and "LOW LIGHT" not displayed with the ND filter 1.3.

[Adjustment Method]

1) Attach the ND filter 1.4 (0.9 + 0.1) to the lens.
2) Turn RV723 and set Pin ⑤ level of the IA-1 board to "H" (5V).
3) Turn RV723 slowly and stop when it become "L" (0V).
4) Remove only ND filter of 0.1.
5) Confirm that the Pin ⑤ level of the IA-1 board becomes "H". (Response will take about 10 seconds.)
6) When it is still in "L" level, repeat steps 1) to 5).

7-4-26. Auto-following White Balance Adjustment (AW-9 Board)

Subject	White pattern *Note 1)
Measurement point	CH1: Pin ⑤ of CN901 (R CONT) CH1: Pin ④ of CN901 (B CONT)
Measurement equipment	Oscilloscope (DC range)
Adjustment element	RV901

Note 1:

Make white-balance sensor (AW-9 board SB901) incident by light through white-dispersing plate which can be applied with the conventional white-lens cap of camera.

Note 2:

No exact adjustment is made by the incident light except pattern-box to the white-balance box.

It is desirable to make adjustment in a dark room, but if it is impossible, make adjustment after taking the following procedures.

1. Place the camera on black paper.
   (This procedure is necessary for the adjustment in a dark room.)
2. Approach the distance between camera and pattern box to less than 0.5m.
3. Cover a black paper on white-balance sensor for preventing the incident light except pattern box to the white-balance sensor.

[Connection]

Make the following connection for setting test-mode.

1. Connect W901 ⑥ pin with GND by jamper wire.
2. Confirm the position of white-balance SW (SW-71 board S941) at indoor "☼".

[Adjustment Method]

1) Turn RV901, and confirm that CH1 takes 2 values of "L" (2.5Vdc) and "H" (2.7Vdc), also that CH2 takes 2 values of "L" (2.0Vdc) and "H" (2.6Vdc).
2) Turn RV901 slowly, and stop it when CH1 shows the position of "H" (2.7Vdc) and CH2 shows the position of "L" (2.0Vdc).

7-4-27. Operation Check for Auto-following White Balance

Subject	White pattern * Note
Filter	Filter C22 for correcting the color temperature
Measurement point	Check on monitor-TV
Measurement equipment	

Note:

See the previous item, Note 2.

[Confirmation Method]

1) Set the white-balance SW to「AUTO」-position. (SW-71 board 941)
2) By covering the camera with a black paper, prevent the incident light except pattern-box to white-balance sensor (AW-9 board SB901).
3) Confirm no-color on the monitor-screen.
4) Cover the filter C22 for correcting the temperature compensation on white-balance sensor. (Prevent the other incident light than the filter by using a black paper.)
5) Confirm the orange-like color of monitor-screen display. (The response needs 1 or 2 seconds.)
6) Return the position of SW to indoor " ".

7-4-28. Check for Backlight Compensation (VC-22 board)

Subject	Color bar chart standard image frame
Measurement point	No. ⑦ terminal of FP-81 Board (CAM OUT)
Measurement equipment	Oscilloscope

[Confirmation Method]

1) Push the button for backlight compensation (SW-71 board S942).
2) Confirm that higher level of Y-signal induces higher chroma-level of "red" and "mazenta" and "blue".
3) Confirm no-color on white-part in monitor-TV screen.

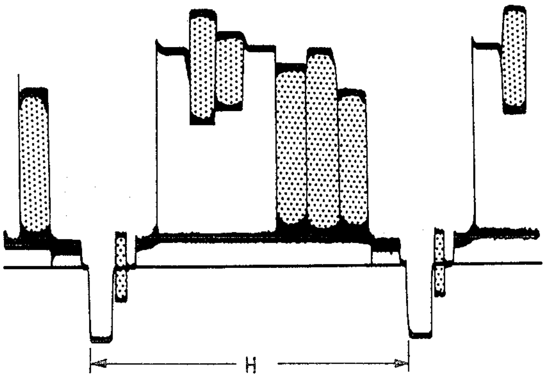
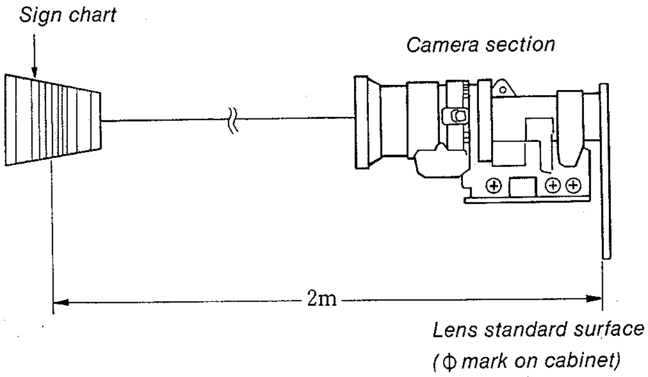


Fig. 7-39.

7-5. AUTO FOCUS SYSTEM ADJUSTMENT

Place sign chart in a position 2m from the lens standard picture as shown in Fig. 7-41. and perform adjustment. As to lighting, make the brightness (200 lux) so that "LOW LIGHT" is not displayed within the EVF.

Unless otherwise specified, perform adjustment by setting the focus switch (S945 on SW-71 board) in the position of "AUTO".



Sign chart
Camera section
2m
Lens standard surface
(ϕ mark on cabinet)

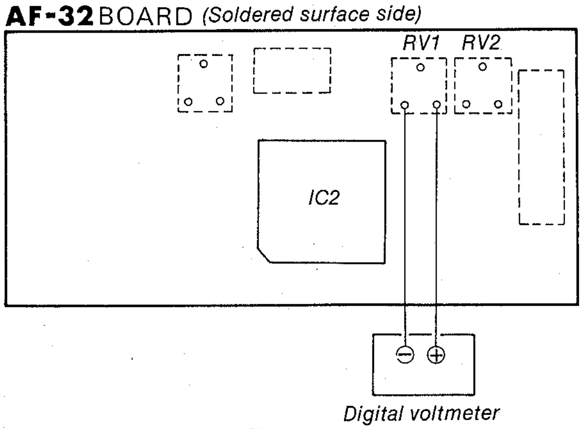
Fig. 7-40.

7-5-1. AD Converter Standard Voltage Adjustment (AF-32 Board)

Subject	Arbitrary
Measurement Point	Both ends of RV-1 (Refer to Fig. 7-41.)
Measurement equipment	Digital voltmeter
Adjustment element	RV1
Specified value	2.04±0.05Vdc

[Adjustment Method]

1) Set focus switch (S945 on SW-71 board) to "auto" position.
2) Adjust to 2.04±0.05Vdc with RV1.



AF-32 BOARD (Soldered surface side)
RV1
RV2
IC2
⊖ ⊕
Digital voltmeter

Fig. 7-41.

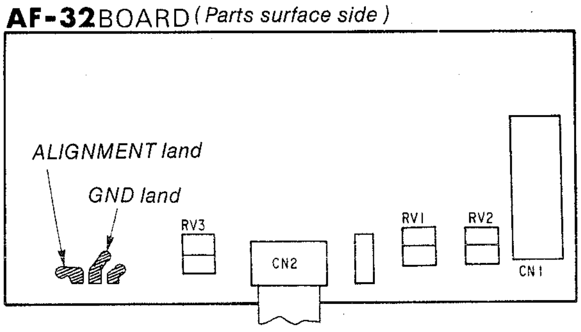
7-5-2. $\overline{Xp}$ Adjustment (AF-32 Board)

Subject	Sign chart (Position of 2.0m forward of lens standard surface (ϕ mark))
Measurement point	CH1: Pin ③ of CN2 CH2: Pin ④ of CN2
Measurement equipment	Oscilloscope (DC range)
Adjustment element	RV2
Specified value	Pulse should be output alternately from CH1 and CH2

[Connection]

1) Connect ALIGNMENT land (Pin ㊶ of IC2) and GND for an instant and set to adjustment mode. (Refer to Fig. 7-42.)

Note: When the focus switch (S945 on SW-71 board) is once set to the "manual" position and then set to the "auto" position, it returns to its original position.



AF-32 BOARD (Parts surface side)
ALIGNMENT land
GND land
RV3
CN2
RV1
RV2
CN1

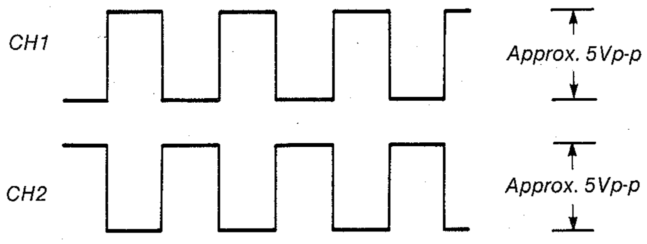
Fig. 7-42.

Setting of switches

1) Focus switch (S945 on SW-71 board)... AUTO
2) Zoom lever... In the vicinity of 40mm

[Adjustment Method]

1) Turn focus ring and set focus indicator to the center of "2".
2) Set with RV2 so that the pulse is output alternately from CH1 and CH2.



CH1
Approx. 5Vp-p
CH2
Approx. 5Vp-p

Fig. 7-43.

7-5-3. Z Axis Adjustment

Subject	Sign chart (Position of 2.0m forward of lens standard surface (ϕ mark))
Specified value	TELE side: ±1.3mm WIDE side: ±10mm

[Adjusting Method]

1) Set focus switch (S945 on SW-71 board) to "auto" position.
2) By refering 7-5-2 1), set to adjustment mode.
3) Set zoom lever to TELE end (72mm).
4) Loosen Z frame securing screw ❶ (Fig. 7-46.)
5) Move the Z frame forward and backward (A ↔ B direction) with the Z frame securing screw so that the focus ring stops at the center of indicator "2". (Figs. 7-45. and 7-46.)
6) Tighten Z frame securing screw ❶ (Fig. 7-46)
7) Set zoom lever to WIDE end (12mm).
8) Turn focus ring to the position of 1.2m.
9) Confirm that the stopping position of the indicator of focus ring is within range of ±10mm from the center of "2". (Fig. 7-45)
10) Turn focus ring to the position of ∞.
11) Confirm that the stopping position of the focus ring is within the same range.
12) If specified value is not satisfied, repeat steps 2) to 11).

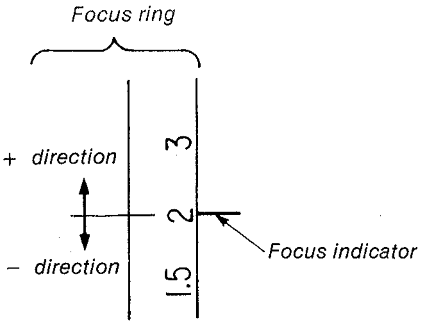

Focus ring
+ direction
– direction
3
2
1.5
Focus indicator

Fig. 7-44.

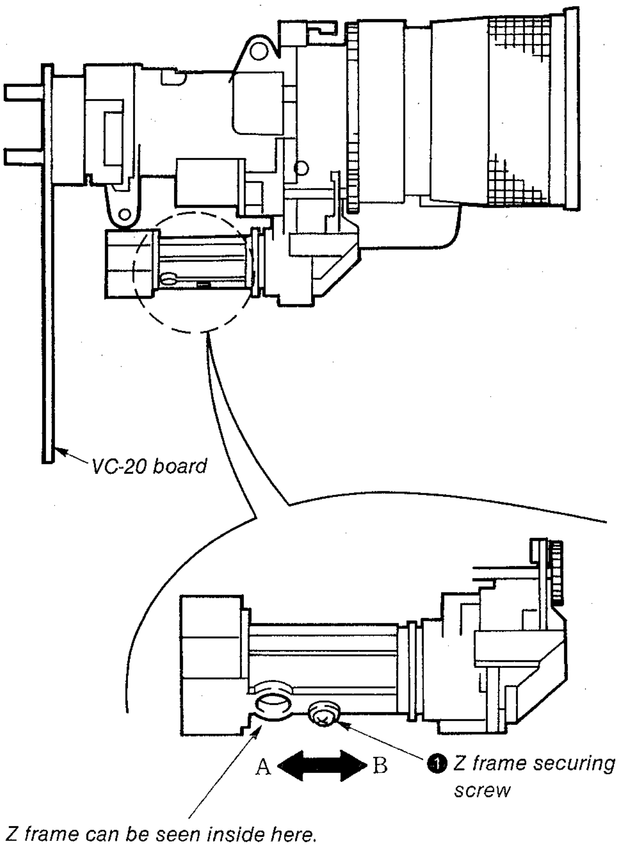

VC-20 board
A
B
❶ Z frame securing screw
Z frame can be seen inside here.

Fig. 7-45.

7-5-4. Motor Voltage Adjustment (AF-32 Board)

Subject	Sign chart (Position of 0.9m forward of lens standard surface (ϕ mark))
Measurement equipment	Stop watch
Adjustment element	RV3
Specified value	2.5 ± 0.5 seconds

Setting of switches

1) Focus switch (S945 on SW-71 board)... MANUAL
2) Zoom lever...In the vicinity of 20mm

[Adjustment Method]

1) Set focus ring to infinity bar end (∞ side).
2) Prss the "pressing auto" button (S945 on SW-71 board).
3) Measure the time from the moment "pressing auto" button is pressed and focus ring rotates, to the moment it reaches short-distance end.
4) If the specified value is not satisfied, turn R3 and repeat steps 1) to 3).

7-5-5. Auto Focus Confirmation

Subject	Sign chart (Position of 2.0m forward of lens standard surface (ϕ mark))
Specified value	TELE side: within ±1.5mm against just focus point during manual WIDE side: within ±15mm against just focus point of TELE

[Adjustment Method]

1) Set the focus switch (S945 on SW-71 board) to the position of "manual".
2) Set the zoom lever to TELE end (72mm).
3) Turn focus ring so that it becomes into focus. Confirm at this time that the focus indicator is within the specified position as shown in Fig. 7-46. In addition, memorize the position of the focus indicator. (If the specifications are not satisfied, perform flange back adjustment.)

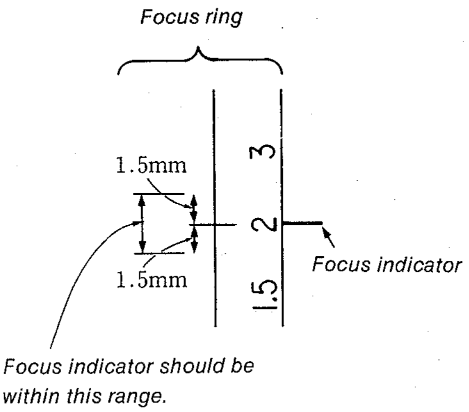


Fig. 7-46.

4) Set the focus switch to the "auto" position.
5) By refering 7-5-2 1), set to adjustment mode.
6) Turn the focus ring to the position of ∞.
7) Confirm that the stopping position of the focus ring is within ±1.5mm against the in-focus position (position of focus indicator memorized in step 3).
8) Turn focus ring to the position of 1.2m.
9) Confirm that the stopping position of the focus ring is within ±1.5mm against the position of in-focus during manual.
10) Secure zoom lever to WIDE end (12mm).
11) Repeat steps 6) to 8). However, the in-focus specifications of WIDE end should be within ±15mm against in-focus of TELE side.

7-6. DIGITAL DISPLAY/DIGITAL TITLER BLOCK ADJUSTMENT

7-6-1. Clock Precision Adjustment (DS-24 Board)

Mode	CAMERA POWER OFF, Install the lithium battery
Subject	Arbitary
Measurement point	Pin ㊶ of IC108
Measurement equipment	Frequency counter
Adjustment element	CT101
Specified value	8192 ± 0.05Hz

[Connection]

Connect Pin ㊱ of IC108 ($\overline{\text{TEST}}$) and GND with jumper wire and set to test mode.

[Adjustment Method]

1) Adjust to 8192 ± 0.05Hz with CT101.

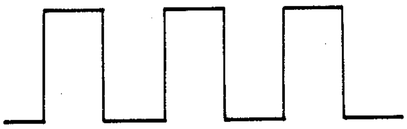


Fig. 7-47.

7-6-2. AD Converter Level Adjustment (DS-24 Board)

Mode	Camera standby
Subject	All black (Cover lens with black cap)
Measurement point	+ probe: Pin ② of IC104 − probe: Pin ③ of IC104
Measurment equipment	Digital voltmeter
Adjustment element	RV102
Specified value	+0.35 ± 0.01Vdc

[Adjustment Method]

Adjust to 0.35 ± 0.01Vdc with RV102.

7-6-3. Chroma Blanking Level Adjustment (DS-24 Board)

Mode	Camera standby
Subject	All black (Cover lens with black cap)
Measurment point	Image output terminal
Measurement equipment	Oscilloscope
Adjustment element	RV101
Specified value	Colour should not appear at superimposed section.

[Adjustment Method]

1) After removing battery (or AC pack) from the grip section, insert again.
2) Set to camera standby mode.
3) Press "MEMORY" button (S948 on SK-21 board) and memorize "all white".
4) Minimize 3.58MHz component with RV101.

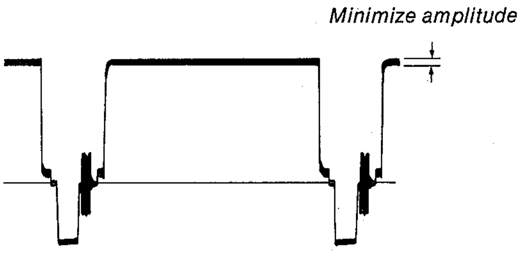


Fig. 7-48.

7-6-4. Digital-Titler Clock Adjustment (DS-24 Board)

Mode	Camera standby
Subject	All black (Cover lens with black cap)
Measurment point	Image output terminal
Measurment equipment	Oscilloscope
Adjustment element	CT103
Specified value	1.5 ± 0.1μsec

[Adjustment Method]

1) Press "MEMORY" button (S948 on SK-21 board) and memorize "all black".
2) Press "COLOR" button (S949 on SK-21 board) and make so that "white" in superimposed.
3) Adjust to 1.5 ± 0.1μsec with CT103.

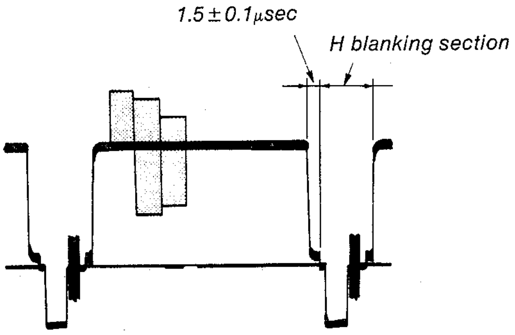


Fig. 7-49.

7-6-5. DDS Display Position Adjustment (DS-24 Board)

Mode	Camera standby
Subject	All black (Cover lens with black cap)
Measuring point	Image output terminal
Measuring instrumnt	Oscilloscope
Adjusting element	CT102
Specified value	6 ± 1μsec

[Adjustment Method]

1) Press "DAY/UP" button (S946 on SW-71 board). (Numeral on the rightmost side of display should not be "1".)
2) Adjust to 6 ± 1μsec with CT102.

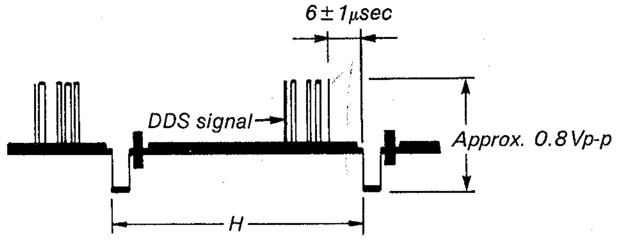
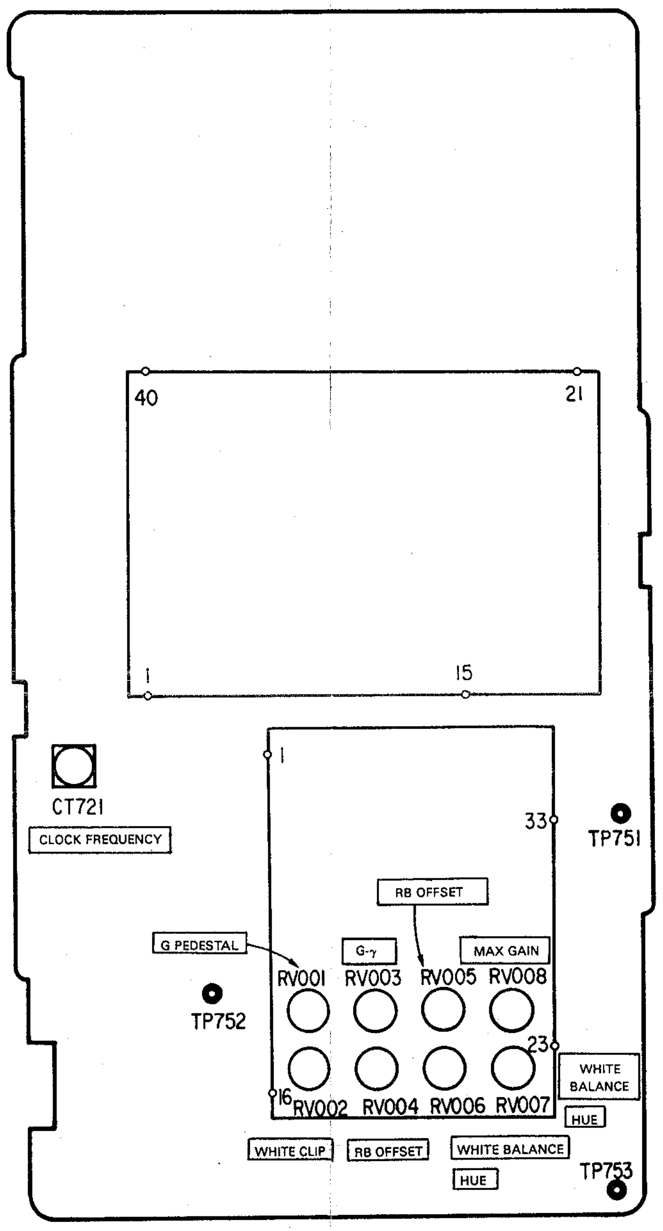

6 ± 1μsec
DDS signal
Approx. 0.8 Vp-p
H

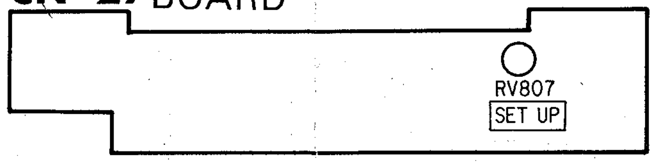
Fig. 7-50.

7-7. ADJUSTMENT ELEMENT LOCATION

VC-20 BOARD

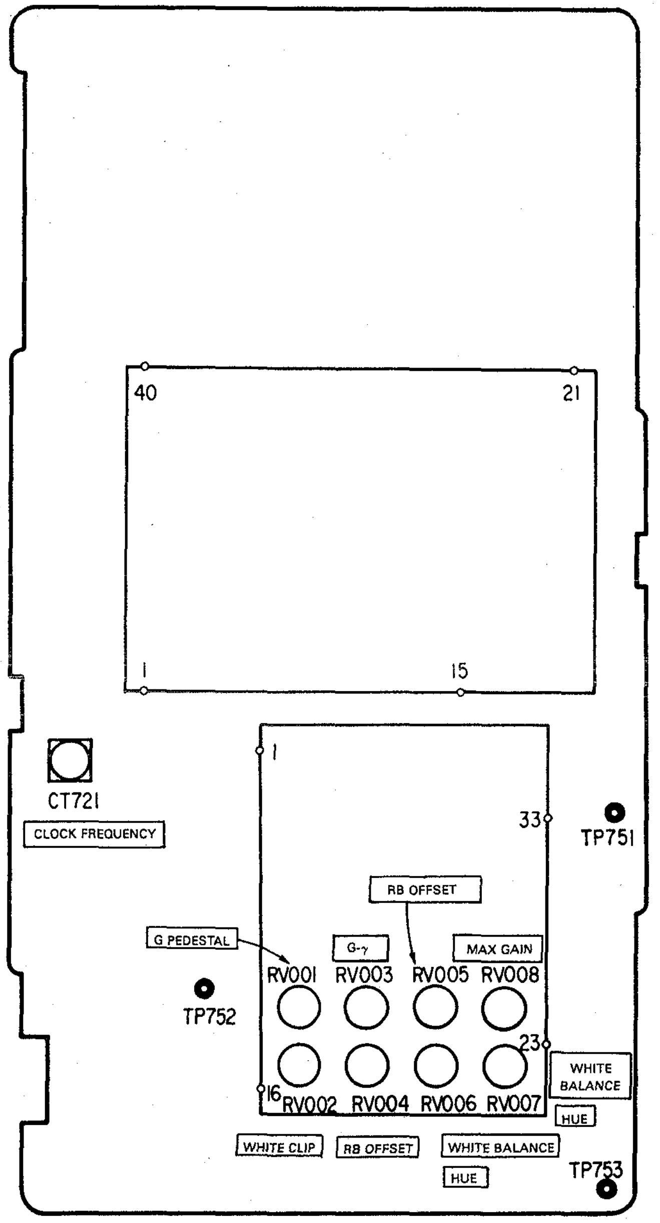

40
21
1
15
1
33
23
16
CT721
CLOCK FREQUENCY
TP751
TP752
TP753
RB OFFSET
G PEDESTAL
G-γ
MAX GAIN
RV001
RV003
RV005
RV008
RV002
RV004
RV006
RV007
WHITE BALANCE
HUE
WHITE CLIP
RB OFFSET
WHITE BALANCE
HUE

CN-27 BOARD

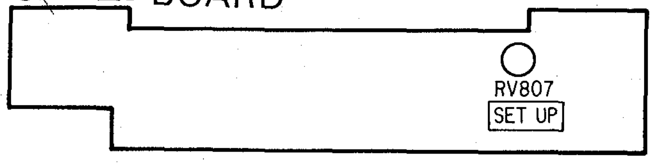

RV807
SET UP

7-7. ADJUSTMENT ELEMENT LOCATION

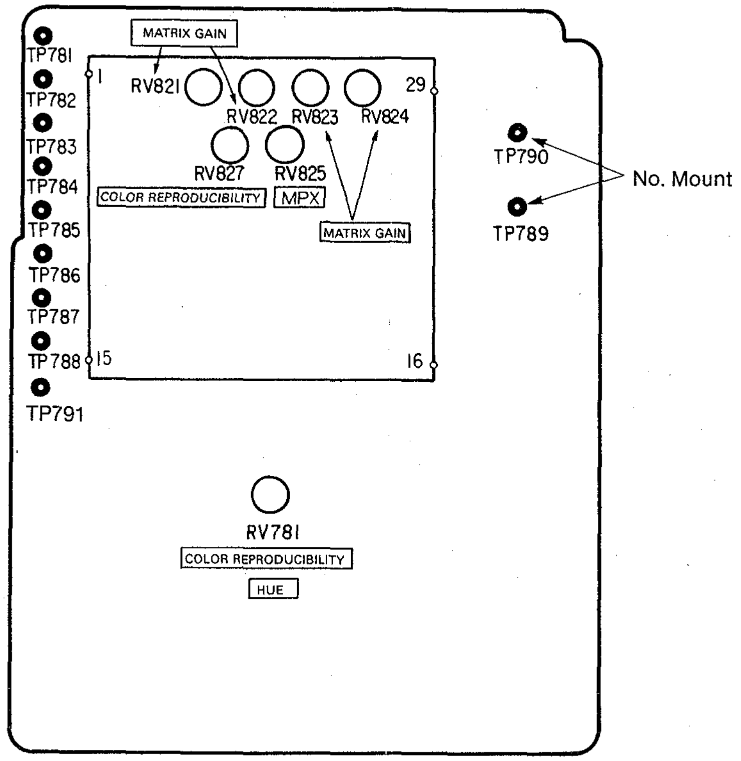
VC-20 BOARD


40
21
1
15
1
33
23
16
CT721
CLOCK FREQUENCY
TP751
TP752
TP753
G PEDESTAL
G-γ
RB OFFSET
MAX GAIN
RV001
RV003
RV005
RV008
RV002
RV004
RV006
RV007
WHITE BALANCE
HUE
WHITE CLIP
RB OFFSET
WHITE BALANCE
HUE

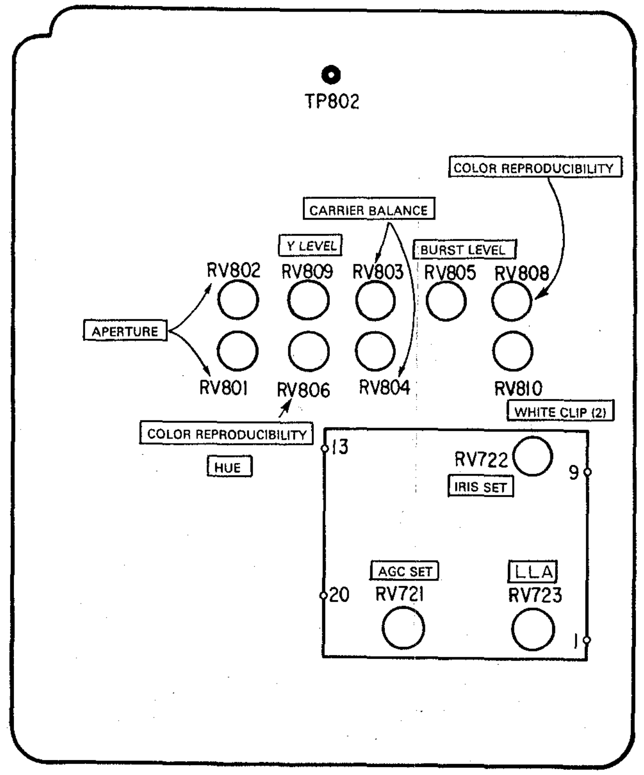
CN-27 BOARD


RV807
SET UP

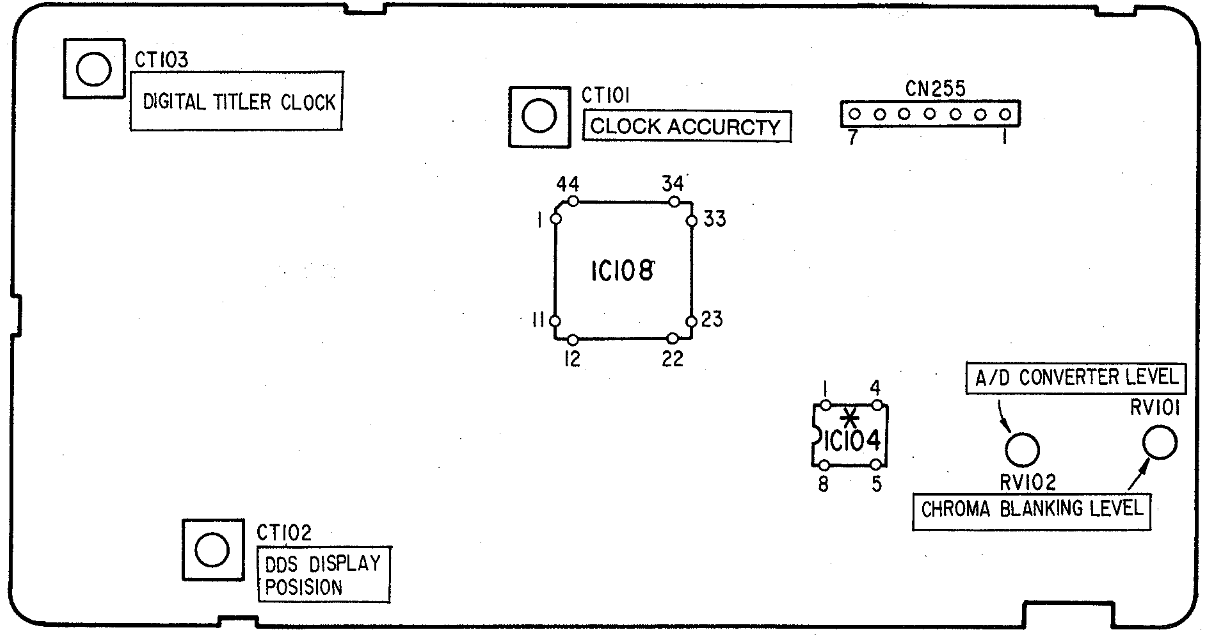
VC-21 BOARD


MATRIX GAIN
TP781
TP782
TP783
TP784
TP785
TP786
TP787
TP788
TP791
1
29
15
16
RV821
RV822
RV823
RV824
RV827
RV825
COLOR REPRODUCIBILITY
MPX
MATRIX GAIN
TP790
TP789
No. Mount
RV781
COLOR REPRODUCIBILITY
HUE

VC-22 BOARD

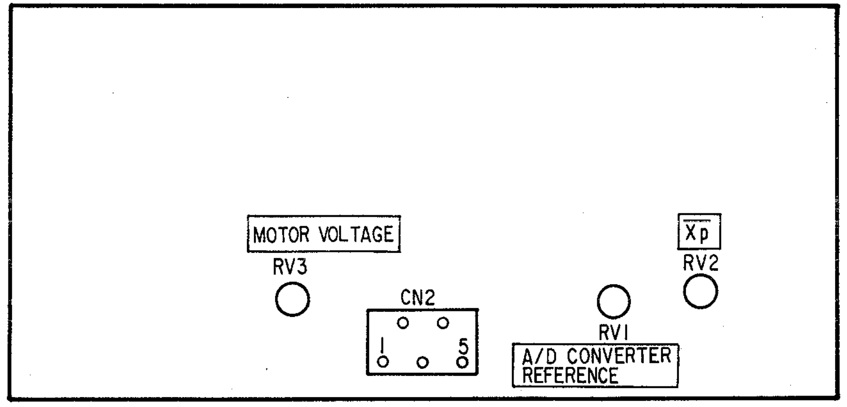

TP802
COLOR REPRODUCIBILITY
CARRIER BALANCE
Y LEVEL
BURST LEVEL
RV802
RV809
RV803
RV805
RV808
APERTURE
RV801
RV806
RV804
RV810
WHITE CLIP (2)
COLOR REPRODUCIBILITY
HUE
13
RV722
IRIS SET
9
AGC SET
L.L.A
20
RV721
RV723
1

DS-24 BOARD (COMPONENT SIDE)

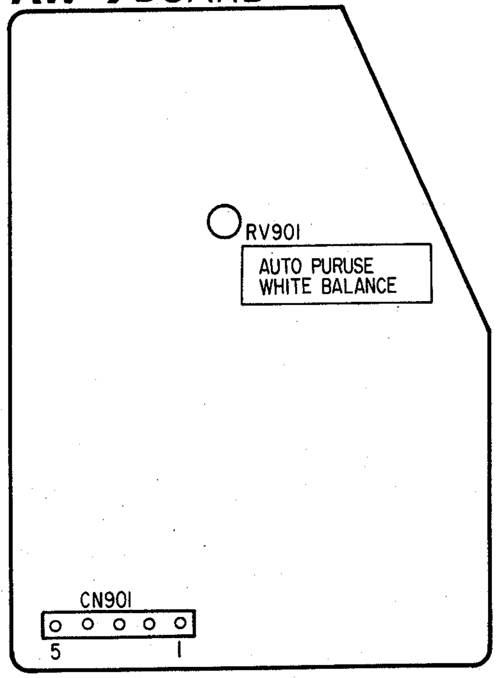

CT103
DIGITAL TITLER CLOCK
CT101
CLOCK ACCURCTY
CN255
7
1
44
34
1
33
IC108
11
23
12
22
1
4
IC104
8
5
A/D CONVERTER LEVEL
RV101
RV102
CHROMA BLANKING LEVEL
CT102
DDS DISPLAY
POSISION

MARKED * IS SOLDERING SIDE

AF-32 BOARD


MOTOR VOLTAGE
RV3
CN2
1
5
RV1
A/D CONVERTER
REFERENCE
$\overline{Xp}$
RV2

AW-9 BOARD


RV901
AUTO PURUSE
WHITE BALANCE
CN901
5
1

243 - 244

SECTION 8
MECHANICAL ADJUSTMENT (VIDEO SECTION)

8-1. PREPARATION FOR CHECK, ADJUSTMENT AND REPLACEMENT OF THE MECHANICAL SECTIONS

With regard to removal of the cabinet, board, etc. see **"SECTION 2 DISASSEMBLY"**
Adjustment of mechanism section is performed in the EJECT state. (In order to make into EJECT state, refer to "8-1-5, Handling of Mode Selector."

8-1-1. Cassette Arm Assembly (See Fig. 8-1)

1. Removal

1) Remove screws ①, ②, ③ and ④.
2) Remove cassette arm assembly ⑤.

2. Installation

1) Install cassette arm assembly ⑤ to the main body so that the two positions of pins ⑥ enter the predetermined positions.
2) Put the dowel ⑧ of the frame assembly into the reference hole ⑦ of the cassette arm, and tighten the screws ① and ② in that order.
3) Install screw ③ loosely and tighten in the order of screw ④ and screw ③.

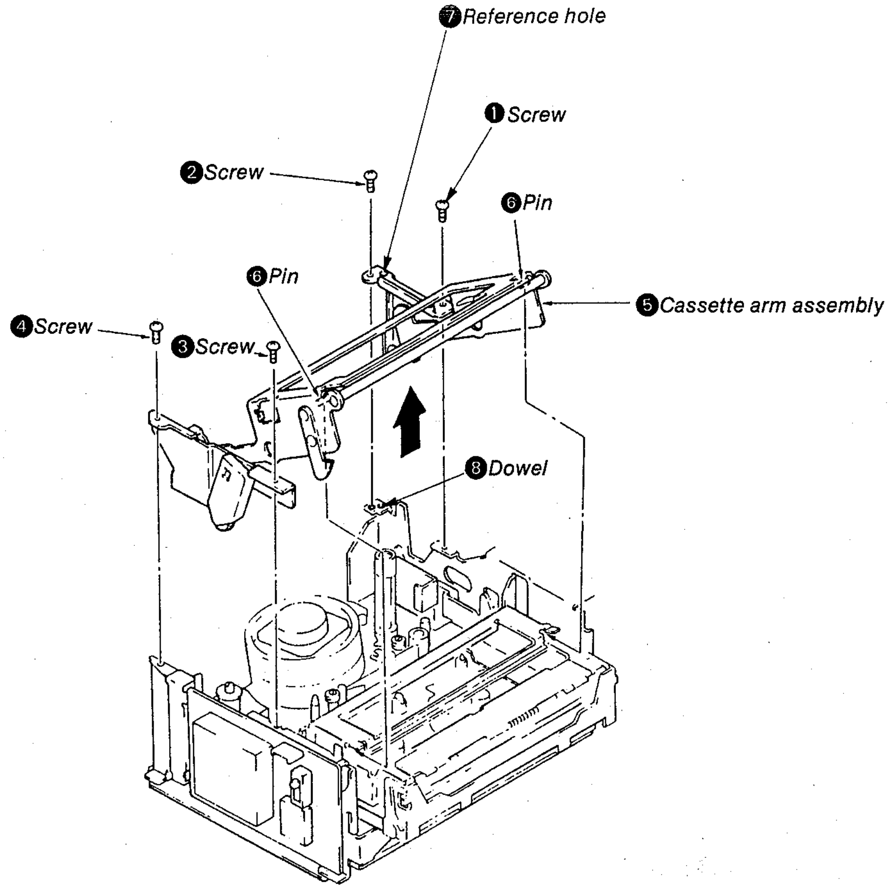

⑦Reference hole
①Screw
②Screw
⑥Pin
⑥Pin
⑤Cassette arm assembly
④Screw
③Screw
⑧Dowel

Fig. 8-1.

8-1-2. LS cassette Compartment Assembly (See Fig. 8-2)

1. Removal

1) Remove screws ①, ②, ③ and ④.
2) Push two positions of the slot ⑧ of LS frame ⑥ in the direction of arrow Ⓐ, and remove two positions of pin ⑤ and ⑨. (Since the pin (C) ⑤ is longer, remove the pin (B) ⑨ first.)
3) Remove LS cassette compartment assembly ⑦.

2. Installation

1) Install LS cassette compartment assembly ⑦ to the main body.
2) Push the two positions of slot ⑧ of LS frame in the direction of arrow Ⓐ , and insert pins ⑤ and ⑨ at two positions. (Since the pin (C) ⑤ is longer, insert this pin first.)
3) Install screws ③ and ④ loosely and tighten in the order of screws ①, ②, ③ and ④.

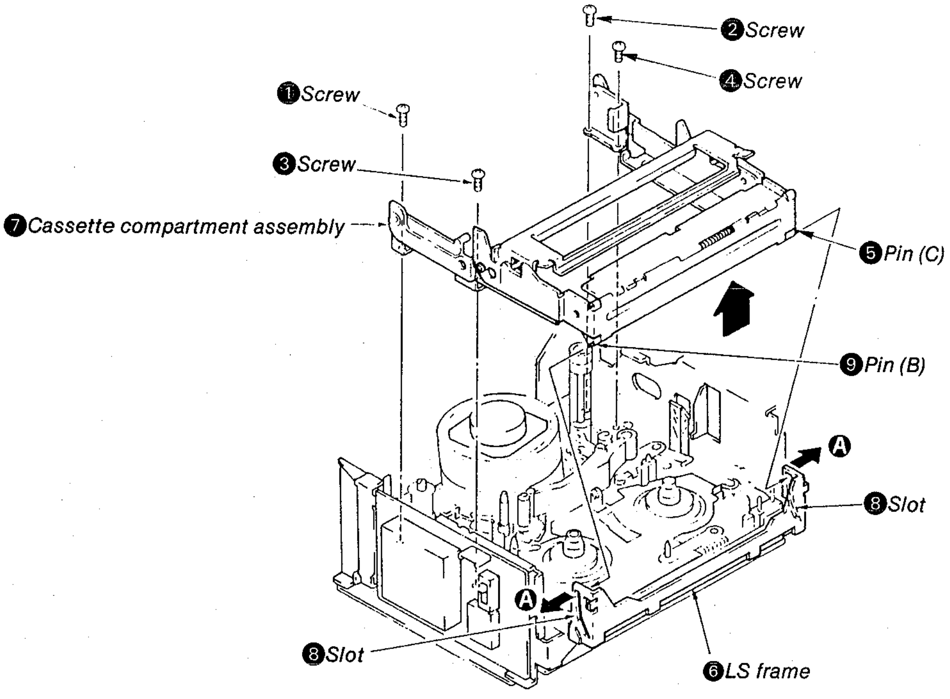

②Screw
④Screw
①Screw
③Screw
⑦Cassette compartment assembly
⑤Pin (C)
⑨Pin (B)
Ⓐ
⑧Slot
Ⓐ
⑧Slot
⑥LS frame

Fig. 8-2.

8-1-3. Extracting Method with the Cassette Loading End State

1) By referring, Section 2 Disassembly 2-6, set SS-70 board up to be able to open.
2) By referring 8-1-5, connect the mode selector.
   Note:
   The mode indicated by ☐ is set by pushing the buttons of the mode selector.
3) Set up [GUIDE LOAD] mode, and move each tape guide from the position shown in Fig. 8-4 to the position shown in Fig. 8-5.
4) Open SS-70 board ❶ and wind up tape into cassette by rotating the rotor ❷ in the direction of arrow. (See Fig. 8-3)
   Note:
   Though in [GUIDE LOAD] mode, cannot wind up tape when each guide is not positioned as shown in Fig. 8-5, close to the casseette.
5) Be sure to wind up tape completely, and set up [EJECT] mode, then take out the cassette.

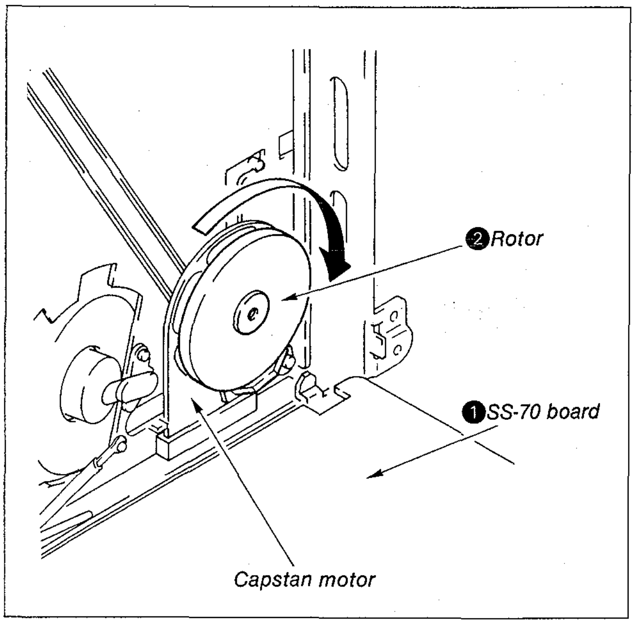

❷Rotor
❶SS-70 board
Capstan motor

Fig. 8-3

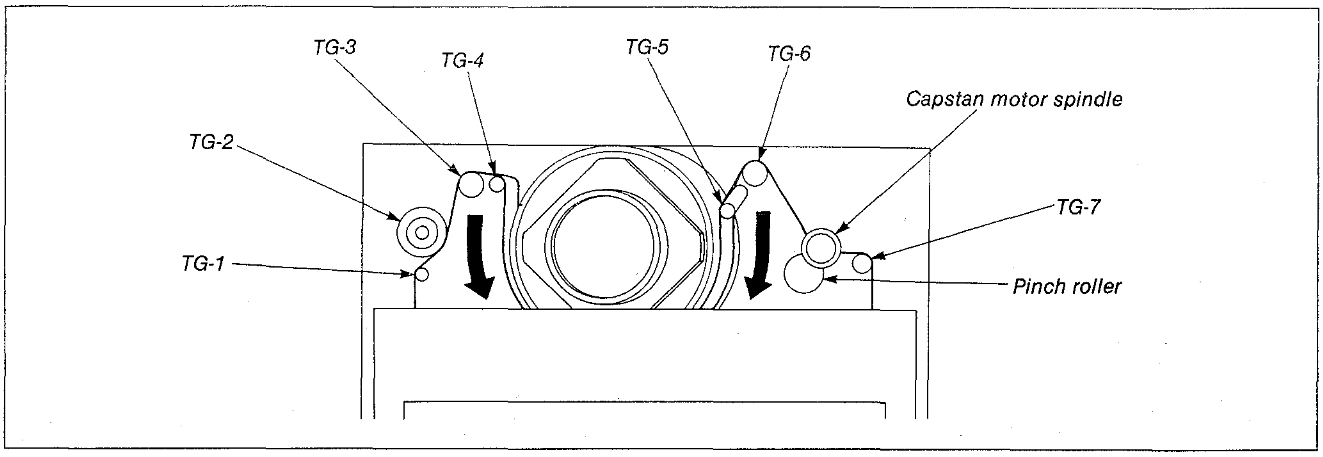

TG-3
TG-4
TG-5
TG-6
Capstan motor spindle
TG-2
TG-7
TG-1
Pinch roller

Fig. 8-4.

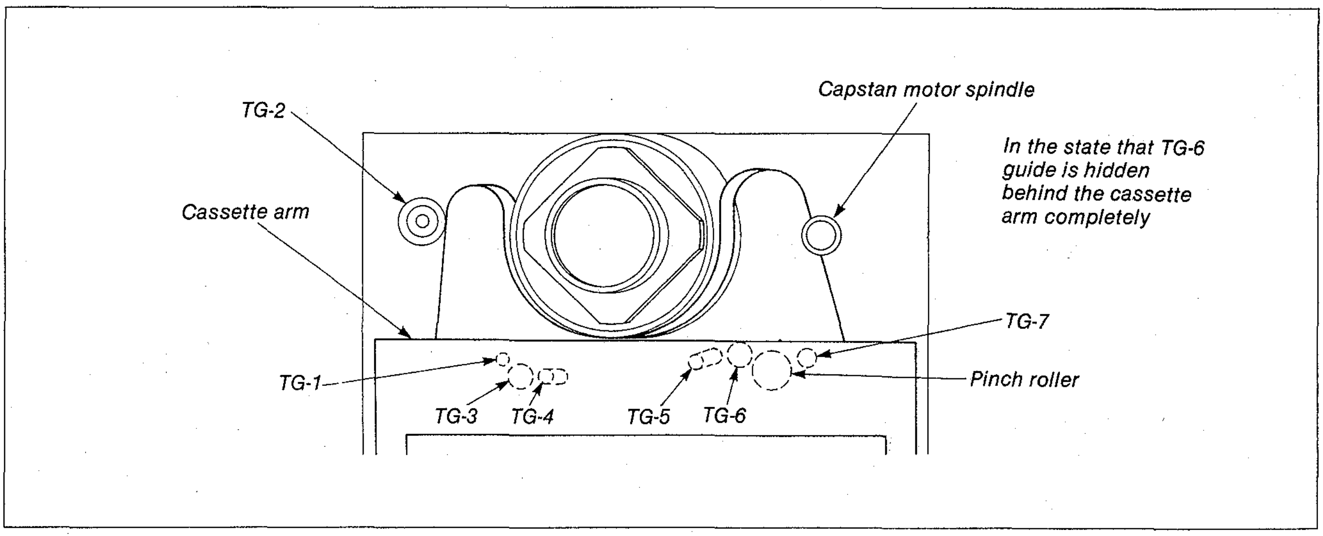

Capstan motor spindle
TG-2
In the state that TG-6 guide is hidden behind the cassette arm completely
Cassette arm
TG-7
TG-1
Pinch roller
TG-3
TG-4
TG-5
TG-6

Fig. 8-5.

8-1-4. Cassette and Cassette Arm Assembly, and a Method to Operate the Set in the State of the LS Cassette Compartment Assembly being Removed

Note: The set may not operate if there is an intense light source near the set.

1. Method to load a cassette. (See Fig. 8-6.)

1) Set the battery pack on the battery holder assembly ❶.
2) Set the battery holder assembly ❶ into the cabinet (L) ❷.
3) Set the connector ❸ which comes out from the cabinet (L) ❷ to pin ❹ of CN205 on the MV-11 board.
4) Cover the LED assembly.
5) Maintain the state in which the pin of push SW ❼ is being depressed (ON state) and secure it with adhesive tape ❽.
6) When pushing the return prevention arm ❾ is pushed into the direction of arrow Ⓐ, the set becomes into the loading state.

2. Method to set into the REC state

1) When step 1 has been completed, set power supply switch ❿ on the SK-19 board to the camera position.

3. Method to EJECT

1) Turn ON the EJECT SW ⓫.

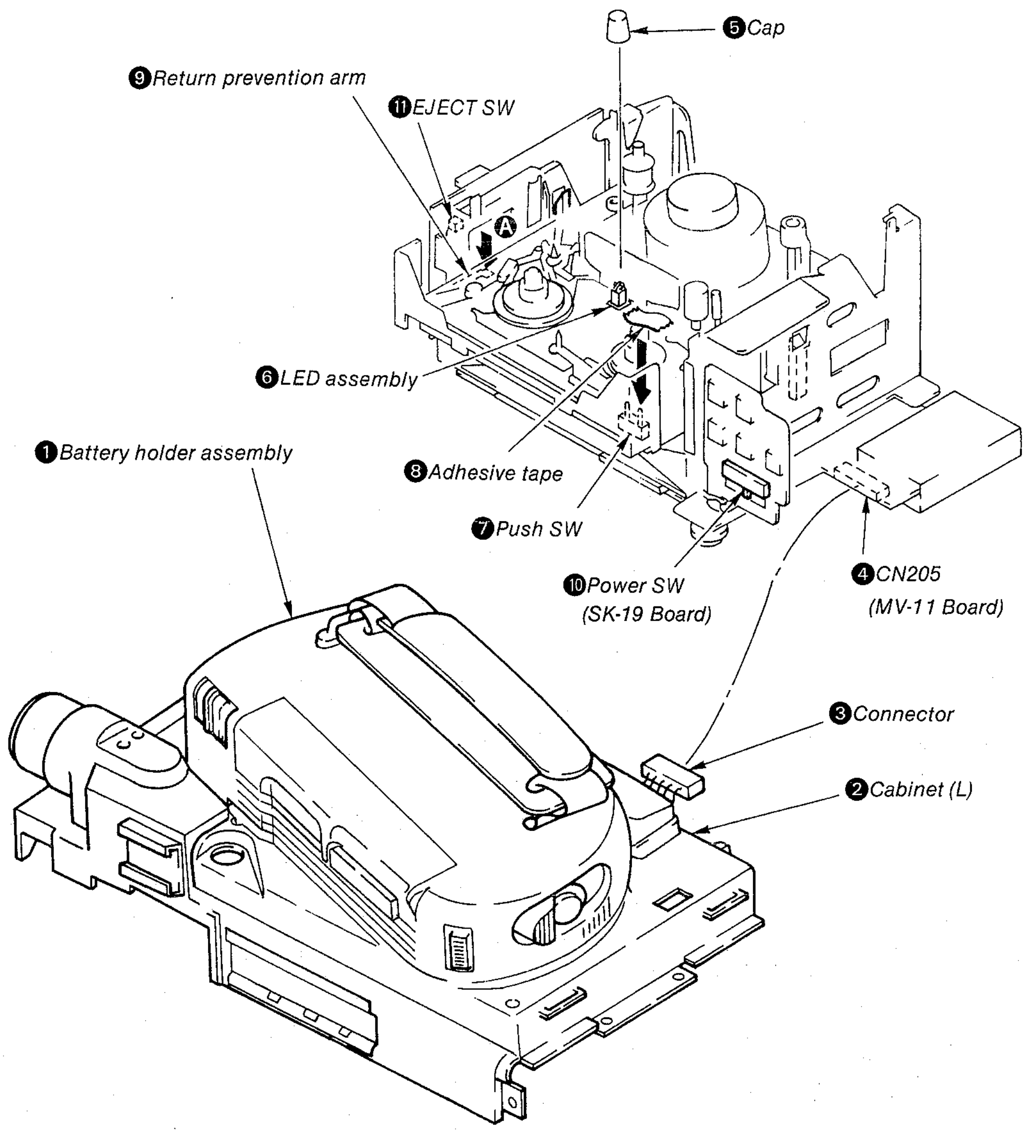

❺Cap
❾Return prevention arm
⓫EJECT SW
Ⓐ
❻LED assembly
❶Battery holder assembly
❽Adhesive tape
❼Push SW
❿Power SW
(SK-19 Board)
❹CN205
(MV-11 Board)
❸Connector
❷Cabinet (L)

Fig. 8-6.

8-1-5. Handling of Mode Selector

- Install mode selector II panel (See Fig. 8-7)

1. Name of each section (See Fig. 8-8)

2. Connection (See Fig. 8-9.)

1) Remove connector of FP-47 flexible board with a flat-blade screwdriver, etc.
2) Insert mode selector II conversion connector.
3) Insert M-SW connector into mode selector II conversion connector.

3. Handling

1) Use only M mode selection button.
2) When selecting, if not in individual modes, "BLANK" is lit.
3) When right side of M mode selection button is pressed continuously, the lamps are lit in the order of EJECT → USE → GUIDE LOAD → REC → READY.
4) When rendering into READY → EJECT, press the selection button on the left side to obtain the objective mode.

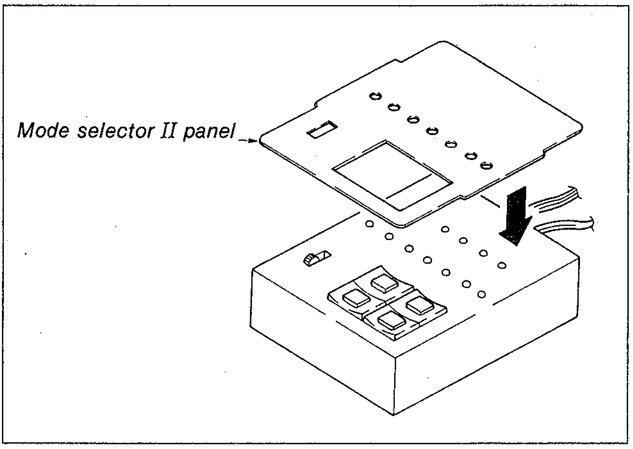

Mode selector II panel

Fig. 8-7.

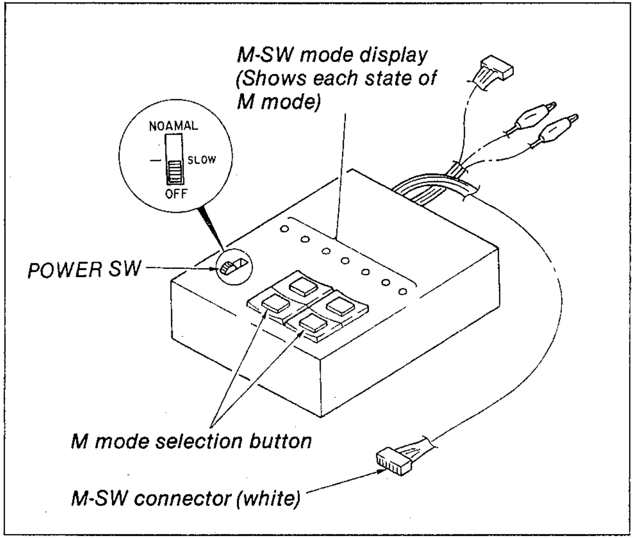

M-SW mode display
(Shows each state of
M mode)
NOAMAL
SLOW
OFF
POWER SW
M mode selection button
M-SW connector (white)

Fig. 8-8.

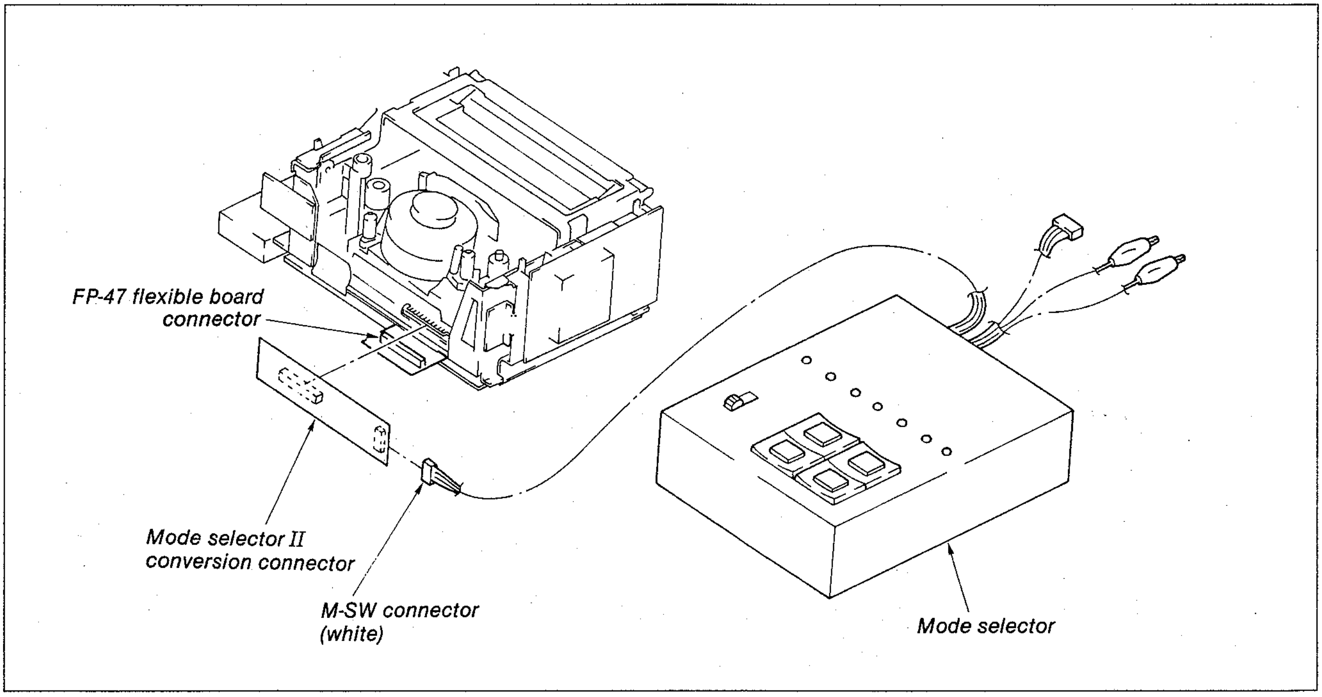
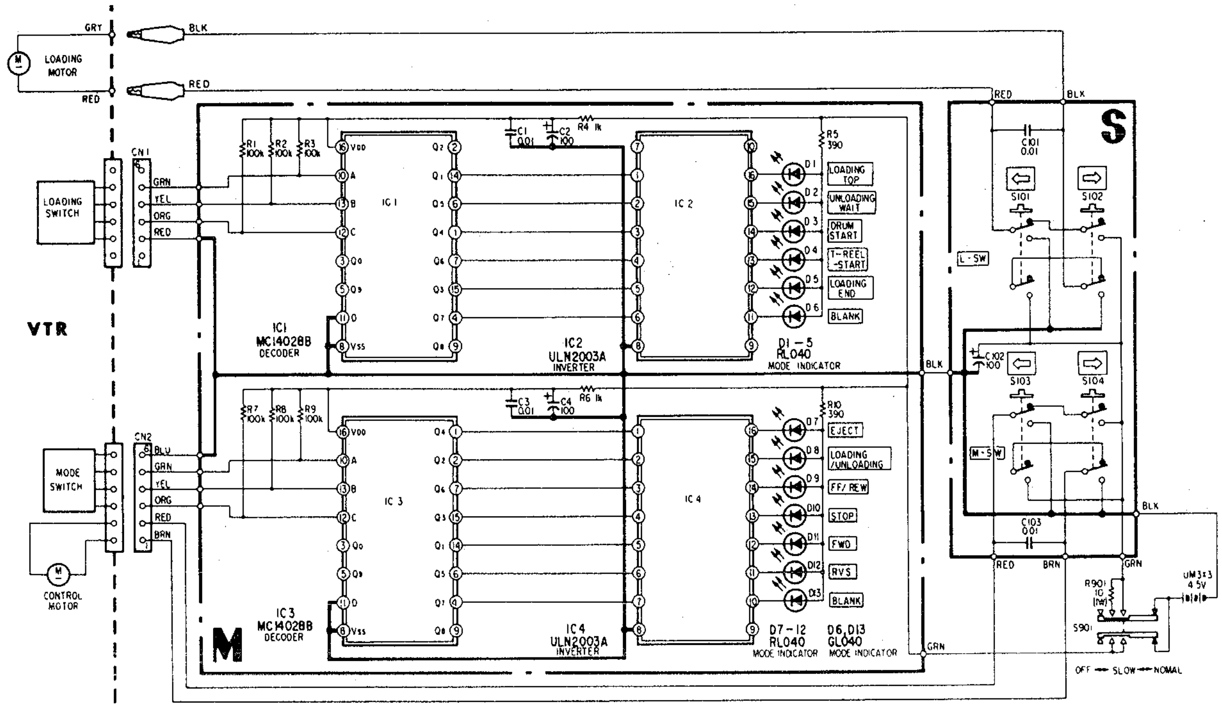

FP-47 flexible board
connector
Mode selector II
conversion connector
M-SW connector
(white)
Mode selector

Fig. 8-9.

4. Mode selector schematic diagram


GRY
BLK
LOADING MOTOR
RED
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
CN2
MODE SWITCH
BLU
BRN
CONTROL MOTOR
R1 100k
R2 100k
R3 100k
C1 0.01
C2 100
R4 1k
R5 390
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
D1-5 RL040 MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL -START
LOADING END
BLANK
R7 100k
R8 100k
R9 100k
C3 0.01
C4 100
R6 1k
R10 390
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D7-12 RL040 MODE INDICATOR
D6,D13 GL040 MODE INDICATOR
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
M
S
C101 0.01
S101
S102
L-SW
C102 100
S103
S104
M-SW
C103 0.01
R901 10 (1W)
UM3×3 4.5V
S901
OFF ← SLOW ← NOMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO.
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END ← LOADING TOP
M-SW RVS ← EJECT

⇨ L-SW LOADING TOP ← LOADING END
M-SW EJECT ← RVS

5. Mode selector parts list

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE	TLR123	
D2	8-719-812-31	DIODE	TLR123	
D3	8-719-812-31	DIODE	TLR123	
D4	8-719-812-31	DIODE	TLR123	
D5	8-719-812-31	DIODE	TLR123	
D6	8-719-812-33	DIODE	TLG123A	
D7	8-719-812-31	DIODE	TLR123	
D8	8-719-812-31	DIODE	TLR123	
D9	8-719-812-31	DIODE	TLR123	
D10	8-719-812-31	DIODE	TLR123	
D11	8-719-812-31	DIODE	TLR123	
D12	8-719-812-31	DIODE	TLR123	
D13	8-719-812-33	DIODE	TLG123A	

Ref. No	Part No.	Description		
		IC		
IC1	8-759-240-28	IC TC4028BP		
IC2	8-759-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL FILM	10	1W

8-2. PERIODIC CHECK AND MAINTENANCE

- In order to fully exhibit the functions and performance of the set, carry out the following maintenance and periodic checks for the equipment and tape. In addition, after repair, carry out the following itemized maintenance irrespective of the user's length of time of usage.

8-2-1. Cleaning of Rotary Drum Assembly

1) Press a chamois cloth (Ref. No.J-2) soaked in cleaning fluid (Ref. No.J-1) lightly against the rotary drum assembly, and slowly rotate the rotary upper drum assembly counter-clockwise by hand to clean.

   Note:

   Do not use the power supply to rotate the motor, and do not rotate the drum clockwise by hand. Also, there is the danger of damaging the head tip if the chamois cloth is moved vertically relative to the head tip, so follow the instruction above for cleaning.

8-2-2. Cleaning of Tape Path (See Fig. 8-10.)

1) Place the cassette compartment assembly in the EJECT state, and clean the tape path (TG-1, 2, 3, 4, 5, 6 and 7, pinch roller, and capstan shaft) with a chamois cloth soaked in cleaning fluid.

   Note:

   Be careful lest the chamois cloth should be stained with oil or grease of each link mechanism.

8-2-3. Cleaning of Drive System

1) Clean the drive system (relay belt and surface of reel tables) with a chamois cloth soaked in cleaning fluid.

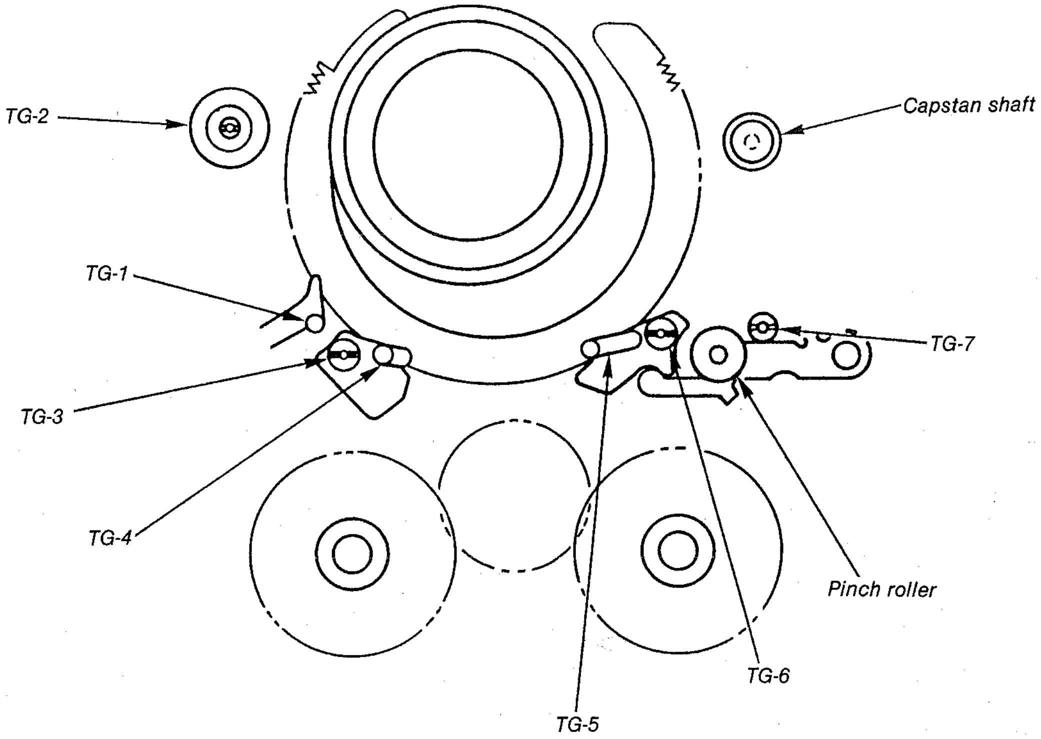


Fig. 8-10.

8-2-4. Periodic Check

	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape Trans-Portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-695-637-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be absolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-508-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○: Cleaning ◎: Oil ☆: Confirmation

Notes:

1) When performing overhaul, refer to the items above when replacing parts.
2) Oil
   - Be sure to use a oil authorized. (There is the danger of various troubles occuring if a different viscosity is used.)
     Oil: Parts No. 7-661-018-18 (MITSUBISHI Diamond Oil HYDROFLUD NT-68)
   - Be absolutely sure to use clean oil without any mixture of dust, etc. when lubricating the shaft bearing. (There is the danger of wear and burning if dirty oil is used with a mixture of dust, etc.)
   - One drop of oil means the amount which sticks to a 2mm diameter rod, as shown in figure. (See Fig. 8-11)

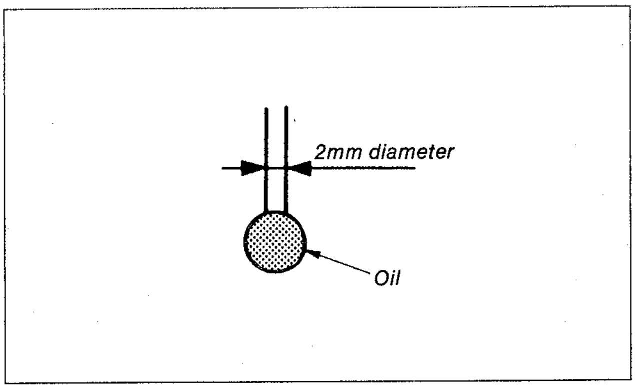


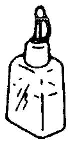
Fig. 8-11.

8-2-5. Service Jig Table

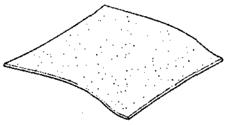
Ref No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Head degausser	Widely available		
J-4	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL5052	Tape path
J-5	Alignment tape (WR5-1N)	8-967-995-01		Tape path
J-6	Dial tension gauge	J-6080-827-A		Various torque measurement
J-7	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-8	Tension measurement reel	J-6080-832-A		With ϕ16 string
J-9	FWD and RVS winding torque cassette	J-6080-624-A	GD-2086	
J-10	Rotary drum jig	(Packed with the repair rotary upper drum)		
J-11	Screwdriver for tape path	J-6080-811-A		For tape guide adjustment
J-12	Mode selector II panel	J-6080-844-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector II conversion connector	J-6080-845-A		
J-15	Tape end detecting filter	J-6080-848-A		Tape end detecting adjustment

Other equipment ●Oscilloscope
●Analog tester (20kΩ)

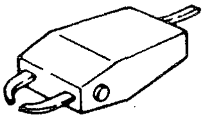
J-1



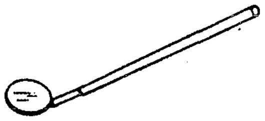
J-2



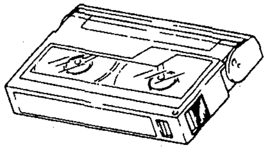
J-3



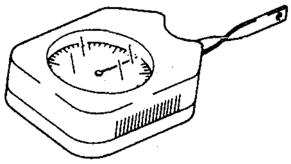
J-4



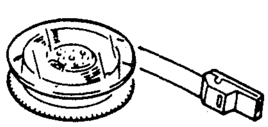
J-5



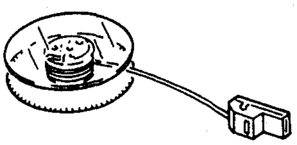
J-6



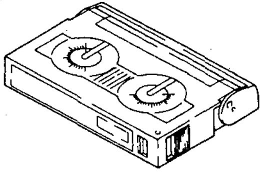
J-7



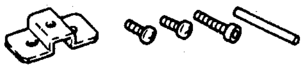
J-8



J-9

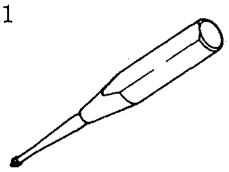


J-10

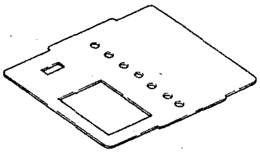


(Packed with the repair rotary upper drum.)

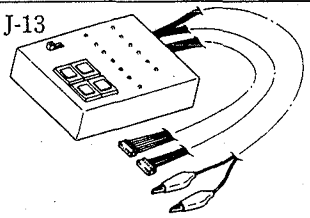
J-11



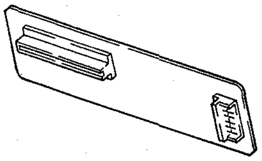
J-12



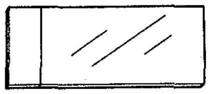
J-13



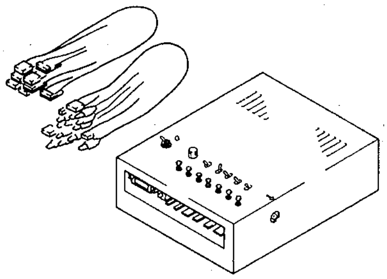
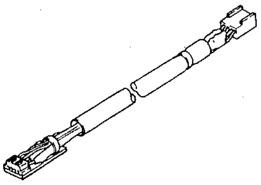
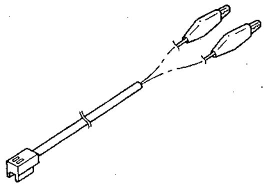
J-14



J-15



Ref No.	Name	Part No.	Usage and Others
J-16	TRACK SHIFT & MONITOR JIG	J-6080-843-A	Tape path
J-17	RF/SWP connector	J-6080-843-2	TRACK SHIFT & MONITOR JIG connection cable
	CTL connector	J-6080-843-2	
J-18	POWER SUPPLY connector	J-6080-843-1	

J-16	J-17	J-18
		

8-3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note:

- Use the mode selector (Ref. No. J-13) for this mechanical check, adjustment and replacement.
- The mode inside the ▭ is the mode set by pressing the mode selector button.

8-3-1. Reel Lock Lever Assembly (See Fig. 8-12)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) Remove tension spring ❶ from notch ❷.
3) Remove stopper washer ❸ and remove reel lock lever assembly ❹ from claw ❸ and shaft ❺.

2. Installation

1) Install reel lock lever assembly ❹ to shaft ❺ and fixed it to stopper washer ❸.
2) Hook the tension coil spring ❶ to notch ❷.
3) By referring to 8-1-1 and 8-1-2, install the cassette arm assembly and LS cassette compartment.

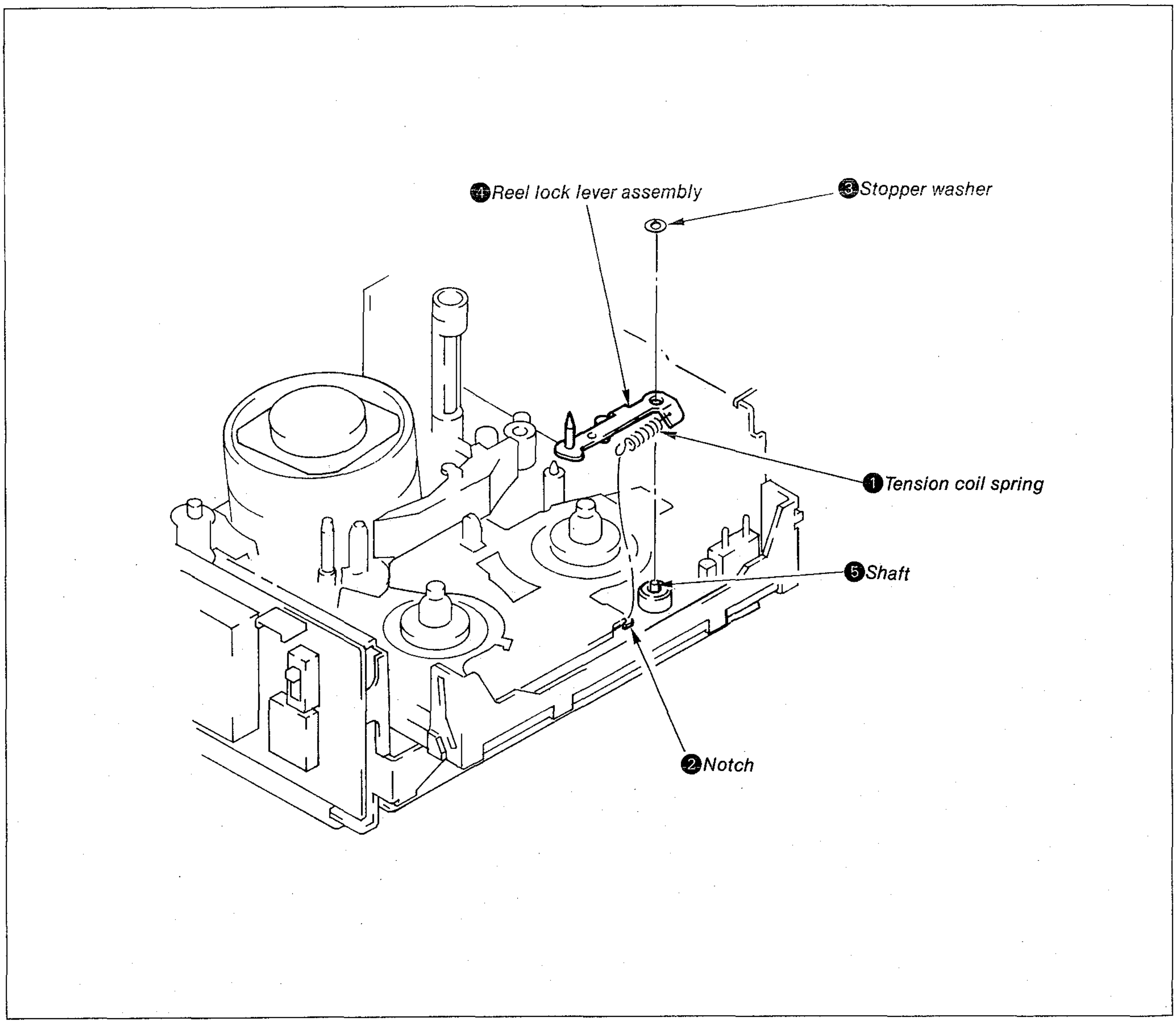

❹Reel lock lever assembly
❸Stopper washer
❶Tension coil spring
❺Shaft
❷Notch

Fig. 8-12.

8-3-2 Pendulum Stopper Plate (See Fig. 8-13.)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove the cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) Pushing the claw ❼ of the LED assembly ❶ in the direction of arrow Ⓐ, lift and remove the LED assembly ❶, and then, remove the claw ❷.
4) Remove two screws ❸ and ❹.
5) Remove pendulum stopper plate ❻ from the two positions of claws ❺.

   Note:

   Since the claw ❼ is easily deformed or broken by too strong pushing force, mount and dismount carefully.

2. Installation

1) Set in READY mode.
2) See to it that the LED assembly ❶ is mounted on the pendulum stopper plate ❻ and fasten to two positions of the claw ❺ and two positions of the dowel ❾.
3) Install two screws ❸ and ❹.
4) Hook claw ❷ of LED assembly ❶ and insert by pushing in the direction of arrow Ⓑ.
5) Set to EJECT mode.
6) By referring to 8-3-1, install the reel lock lever assembly.
7) By referring to 8-1-1 and 8-1-2, install the cassette arm assembly and LS cassette compartment assembly.

   Note:

   - Caution should be taken that the TG-1 band assembly ❽ is not clasped in when installing the pendulum stopper plate ❻.
   - In other modes than READY, the band becomes loose.

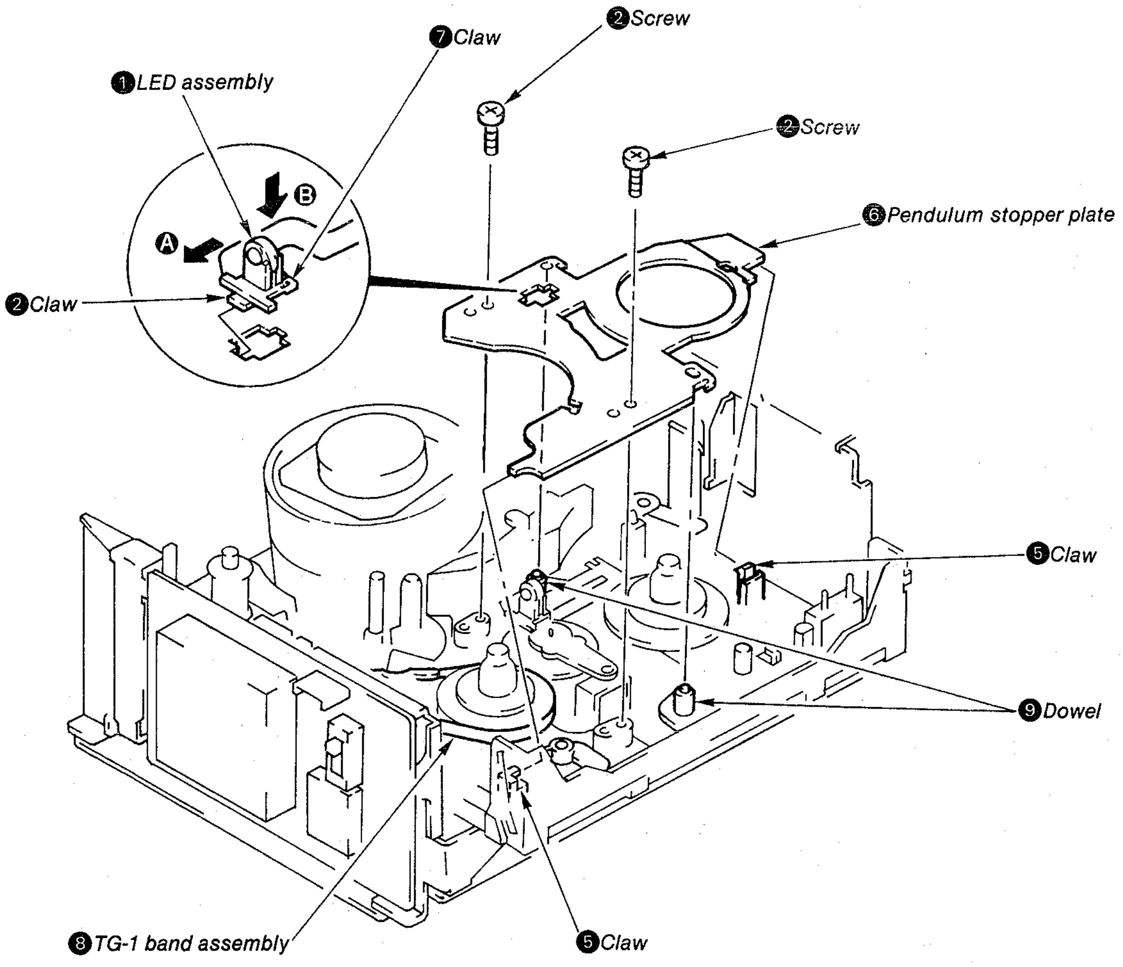


Fig. 8-13.

8-3-3. S Reel Table Assembly (See Fig. 8-14)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) By referring to 8-3-2, remove pendulum stopper plate.
4) Remove screw ❶, and remove one side of TG-1 band assembly ❷.
5) Move the soft brake ❸ in the direction of arrow Ⓐ.
6) Remove S reel table assembly ❹.

Note:

Perform removal of S reel table assembly ❹ by holding the * marked section of reel claw.

2. Installation

1) Apply over 1/3 drop and below 1/2 drop of oil to the arrow section of shaft ❺ as in Fig. A.
2) Move soft brake ❸ in the direction of arrow Ⓐ.
3) Install S reel table assembly ❹ to the shaft.
4) Install screw ❶ to TG-1 band assembly ❷.
5) By referring to 8-3-2, install pendulum stopper plate.
6) By referring to 8-3-1, install reel lock lever assembly.
7) By referring to 8-1-1, install cassette arm assembly and LS cassette compartment assembly.

Note:

1) By referring to 8-3-26, perform check of reel table height.
2) By referring to 8-3-28, perform position adjustment of tension regulator.
3) By referring to 8-3-29, perform adjustment of back tension.

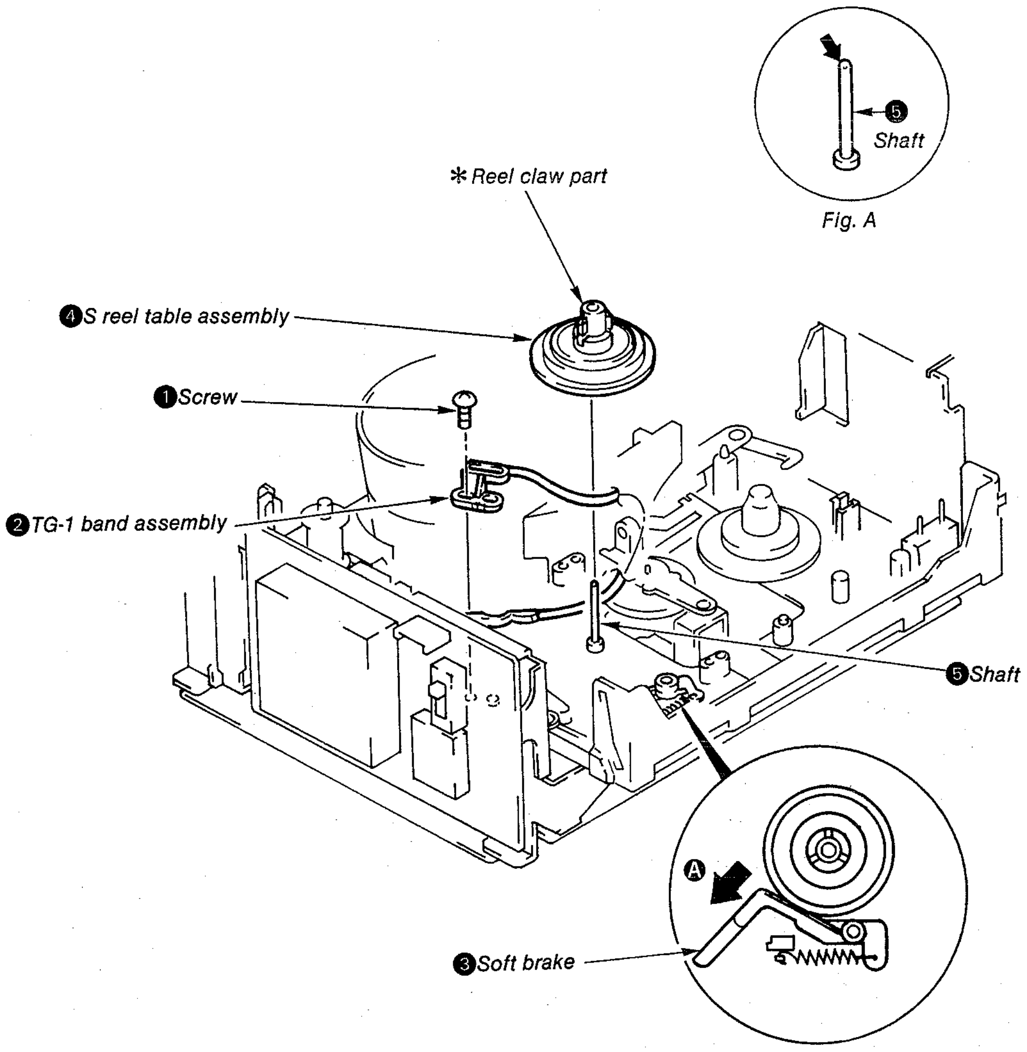


Fig. 8-14.

8-3-4. T Reel Table Assembly (See Fig. 8-15)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove the cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) By referring to 8-3-2, remove pendulum stopper plate.
4) Remove T reel table assembly ❶.

Note:

Perform removal of T reel table assembly ❶ by holding the reel claw section marked with ∗.

2. Installation

1) Apply over 1/3 drop and below 1/2 drop of oil to the arrow section of shaft ❷, as in Fig. A.
2) Install T reel table assembly ❶ to shaft ❷.
3) By referring to 8-3-2, install pendulum stopper plate.
4) By referring to 8-3-1, install reel lock lever assembly.
5) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

Note:

By referring to 8-3-26, perform check of reel table height.

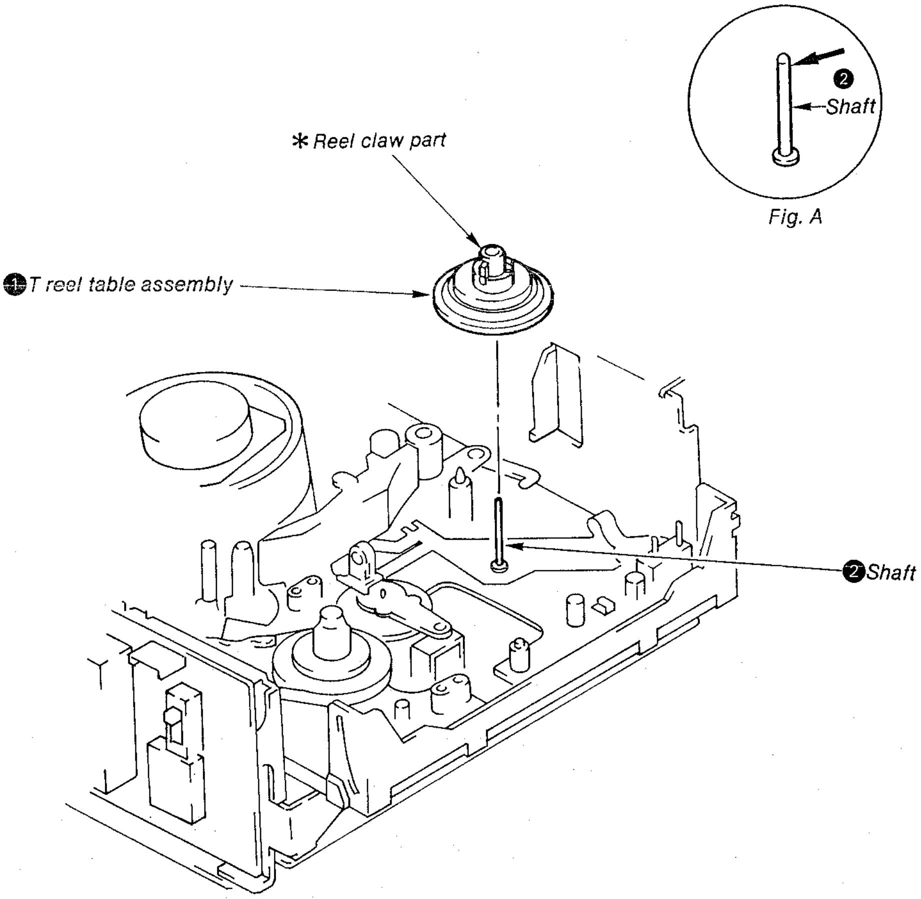


Fig. 8-15.

8-3-5. Pinch Arm B Assembly (See Fig. 8-16)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly, and LS cassette compartment.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) By referring to 8-3-2, remove pendulum stopper plate.
4) By referring to 8-3-4, remove T reel table assembly.
5) Remove tension coil spring ❶ from claw ❷.
6) Remove stopper washer ❸, and remove pinch arm B assembly ❹.

2. Installation

1) Apply molten grease to the arrow section of pinch arm B assembly ❹, as shown in Fig. A.
2) Apply over 1/3 drop and below 1/2 drop of oil to the arrow section of shaft ❺, as shown in Fig. B.
3) See to it that pinch arm B assembly ❹ pin enters hole ❻ and pinch arm A ❼, and install to shaft ❺.
4) Install stopper washer ❸.
5) Hook the tension coil spring ❶ onto claw ❷.
6) By referring to 8-3-4, install T reel table assembly.
7) By referring to 8-3-2, install pendulum stopper plate.
8) By referring to 8-3-1, install reel lock lever assembly.
9) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

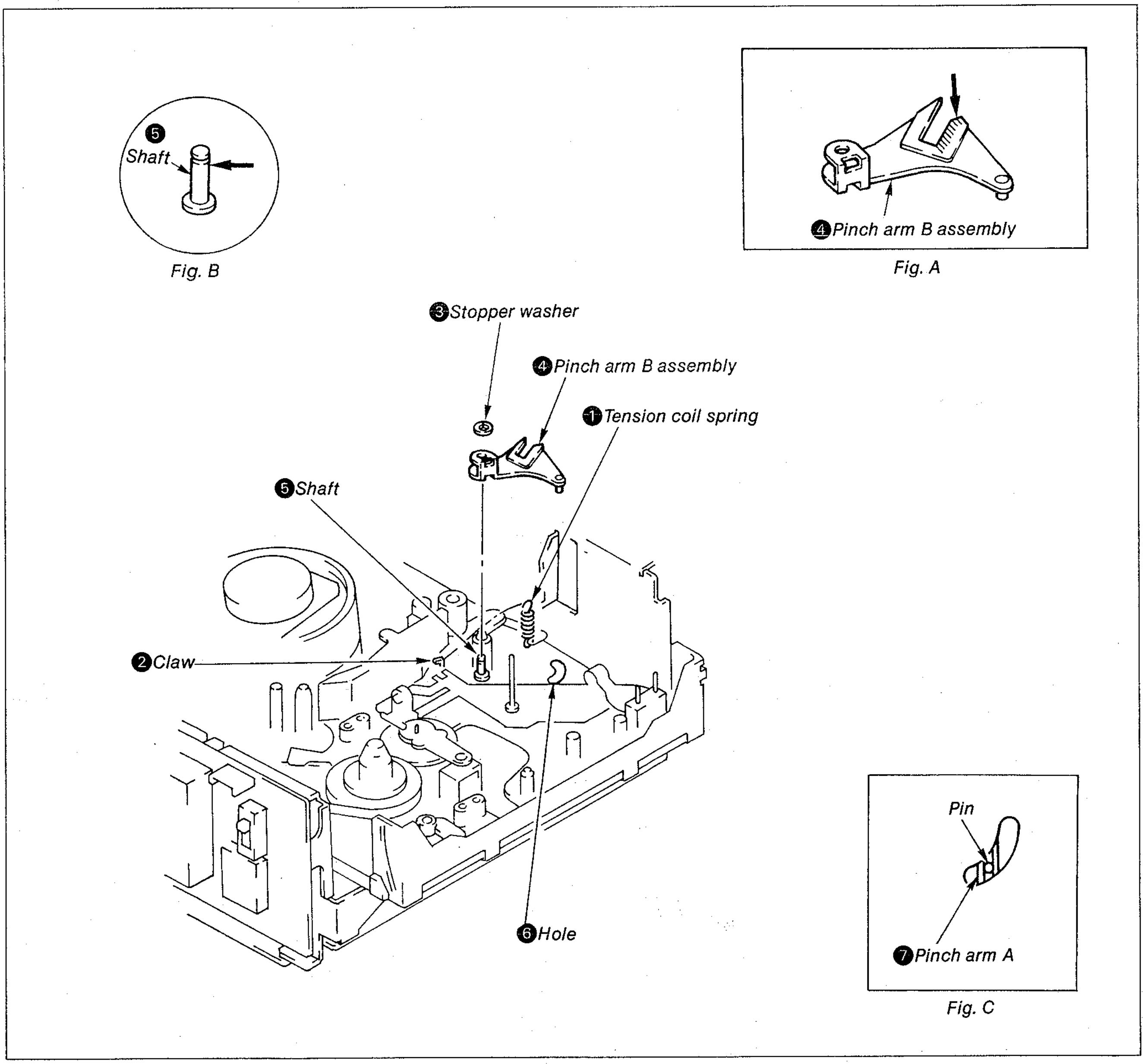

❺
Shaft
❹Pinch arm B assembly
❸Stopper washer
❹Pinch arm B assembly
❶Tension coil spring
❺Shaft
❷Claw
❻Hole
Pin
❼Pinch arm A

Fig. B

Fig. A

Fig. C

Fig. 8-16.

8-3-6. Pinch Arm C Assembly (See Fig. 8-17)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) By referring to 8-3-2, remove pendulum stopper plate.
4) Remove tension coil lever ❶ from claw ❷.
5) Remove stopper washer ❸, and remove pinch arm C assembly ❹ and pinch lever assembly ❺.
6) Remove tension coil spring ❻, and disassemble pinch arm C assembly ❹ and pinch lever assembly ❺.

   Note:

   Do not touch the roller section marked with ✻.

2. Installation

1) Apply over 1/3 drop and below 1/2 drop oil to the arrow section of shaft ❼, as shown in Fig. A.
2) Install pinch lever assembly ❺ to pin arm C assembly ❹, and hook on tension coil spring ❻.
3) Install pinch arm C assembly ❹ and pin lever assembly ❺ to shaft ❼.
4) Install stopper washer ❸.
5) Hook tension coil spring ❶ to claw ❷.
6) By referring to 8-3-2, install pendulum stopper plate.
7) By referring to 8-3-1, install reel lock lever assembly.
8) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

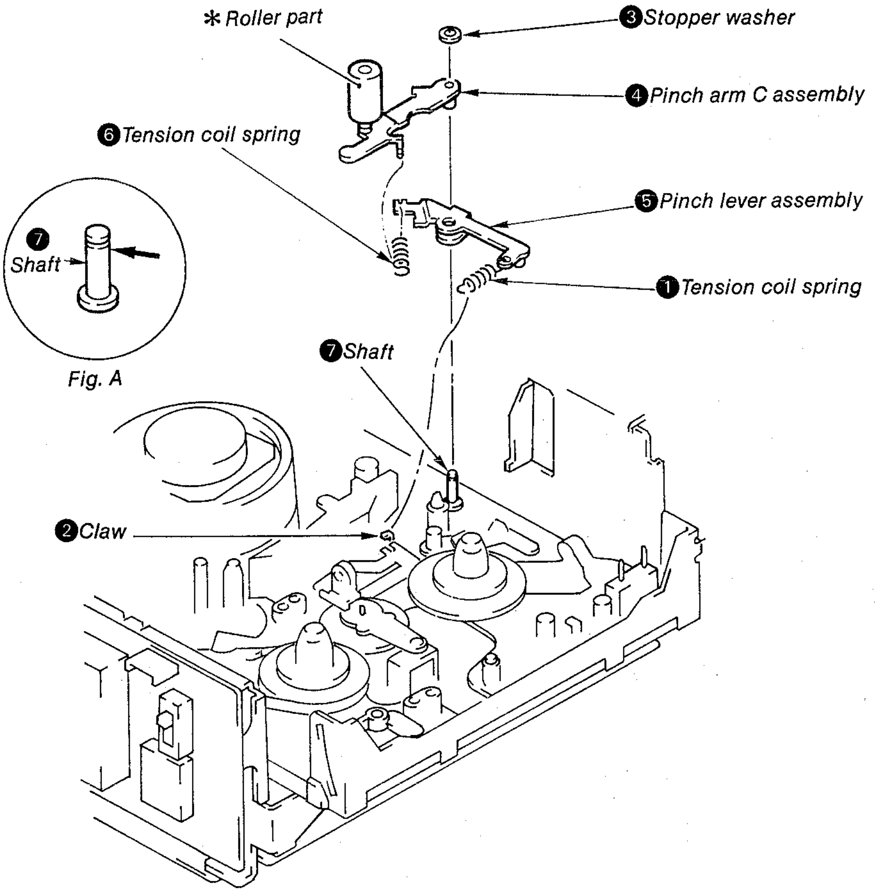

✻ Roller part
❸Stopper washer
❹Pinch arm C assembly
❻Tension coil spring
❺Pinch lever assembly
❼
Shaft
❶Tension coil spring
Fig. A
❼Shaft
❷Claw

Fig. 8-17.

8-3-7. TG-1 Arm Assembly (See Fig. 8-18)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) By referring to 8-3-2, remove pendulum stopper plate.
4) Remove stopper washer ❶, and remove 1 screw ❷.
5) Remove tension coil spring ❸, and remove TG-1 arm assembly ❹.

Note:

Do not touch the shoe section marked with *, (see Fig. 8-19) and guide section marked with *.

2. Installation

1) Apply over 1/3 drop and below 1/2 drop of oil to the arrow section of shaft ❺, as shown in Fig. A.
2) Install TG-1 arm assembly ❹ to shaft ❺. (Do not touch the guide section)
3) Wind the TG-1 band assembly ❼ around the outer circumference of S reel table assembly ❻, and install 1 screw ❷.
4) Install stopper washer ❶.
5) Hook tension coil spring ❸ onto the position indicated in Fig. B.
6) By referring to 8-3-2, install pendulum stopper plate.
7) By referring to 8-3-1, install reel lock lever assembly.
8) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

Notes:

1) Be careful so as not to have any curving in the TG-1 band assembly ❽.
2) By referring to 8-3-28, perform tension regulator position adjustment.
3) By referring to 8-3-29, perform FWD back tension adjustment.

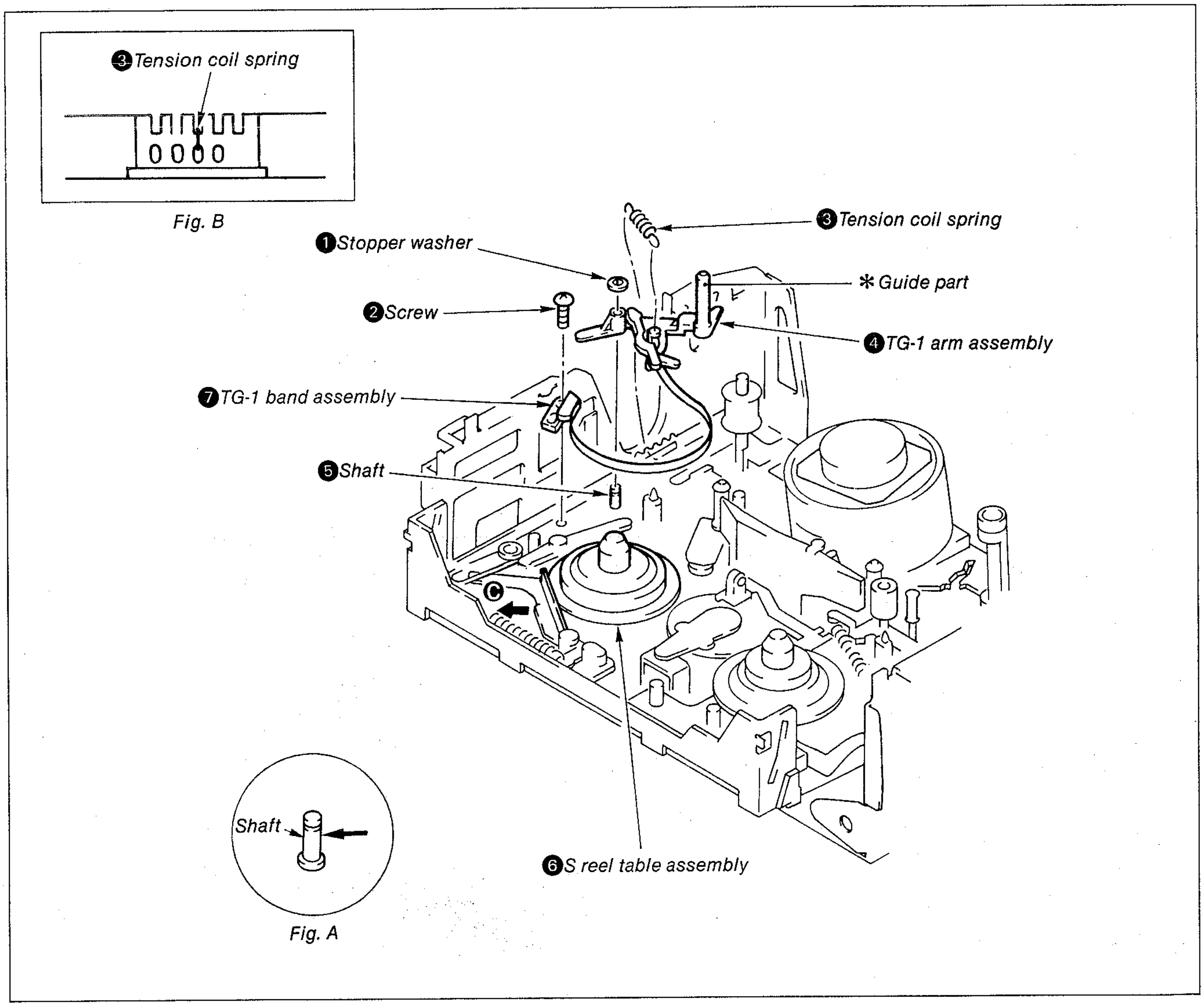

❸Tension coil spring
Fig. B
❶Stopper washer
❷Screw
❼TG-1 band assembly
❺Shaft
❸Tension coil spring
* Guide part
❹TG-1 arm assembly
❻S reel table assembly
Shaft
Fig. A

Fig. 8-18.

8-3-8. TG-1 Band Assembly (See Fig. 8-19)

1. Removal

1) By referring to 8-3-7, remove TG-1 arm assembly.
2) Remove claw ❷, of TG-1 band assembly from slot of TG-1 arm assembly ❸.

2. Installation

1) Install claw ❷ of TG-1 band assembly ❶ into hole of TG-1 arm assembly ❸.
2) Confirm that the TG-1 band assembly ❶ rotates smoothly centering around the hole of the TG-1 arm assembly ❸.
3) By referring to 8-3-7, install TG-1 arm assembly.

Notes:

1) Be careful so as not to have any curving in the TG-1 band assembly ❶.
2) Do not touch the shoe section marked with ✻ and guide section marked with ✻.

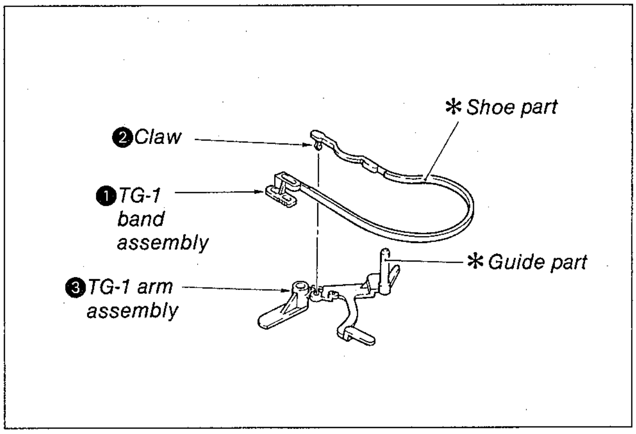


Fig. 8-19.

8-3-9. Soft Brake Assembly (See Fig. 8-20)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever assembly.
3) By referring to 8-3-2, remove pendulum stopper plate.
4) Remove tension coil spring ❶ from claw ❷.
5) Remove soft brake assembly ❸. (See Fig. 8-20)

2. Installation

1) Install soft brake assembly. At this time place the Ⓐ section under the LS plate spring ❹.
2) Hook tension coil spring ❶ onto claw ❷.
3) By referring to 8-3-2, install reel lock lever assembly.
4) By referring to 8-3-1, install reel lock lever.
5) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

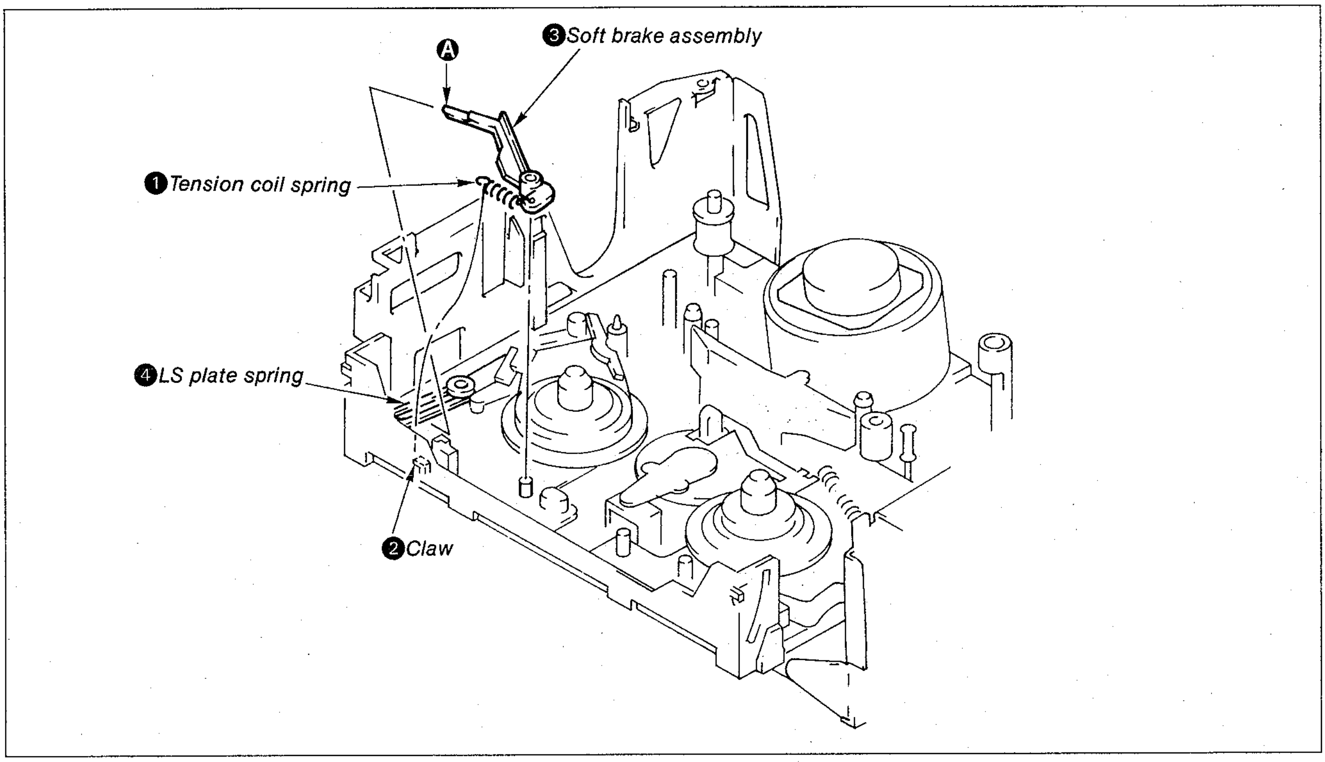


Fig. 8-20.

8-3-10. LS Chassis Assembly (See Fig. 8-21)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) Set to GUIDE LOAD after BLANK.
3) Remove stopper washer ❶.
4) Remove three each of screws ❷ and LS guide ❸.
5) Remove LS chassis assembly ❹ in the direction of arrow Ⓐ.
6) Remove 7 sections of the soldered sections ❻ of FP-53 flexible board ❺ with a soldering iron, as shown in Fig. A. and remove FP-53 flexible board ❺ which is stuck to the mechanical chassis.

2. Installation

1) Peel off tape attached to the rear of FP-53 flexible board ❺, and stick on by matching the shaft of the mechanical chassis with the pattern.
2) Solder the sections of the FP-53 flexible board ❺, as shown in Fig. B.
3) Apply molten grease to the arrow section of LS chassis assembly ❹, as shown in Fig. C.
4) Move reel lock lever assembly ❻ in the direction of arrowⒺ, and install by matching the four positions of the attachment holes of LS chassis assembly ❹ with the shaft of the mechanical chassis.
5) Engage two positions of claw ❼ to drum base.
6) Move TG-7 arm assembly ❽ in the direction of arrowⒻ, (gently with tweezers, etc.), and insert into the hole of the mechanical chassis.
7) Insert pin ❿ of LS gear assembly to slot ❾ of LS cam plate, as shown in Fig. D.
8) Insert TS arm ⓫ into U groove of pinch arm A ⓬.
9) Confirm that the reel lock lever assembly ❻ is not run onto the reel lock lever B ⓭.
10) Confirm that the TG1 release arm ⓮ is not run onto the M slider ⓯.
11) Confirm that the pin of pendulum gear arm assembly ⓰ is peeping out of the hole of the pendulum stopper plate ⓱.

    Note:

    Confirm tht mechanical chassis assembly parts have been properly assembled.
12) Confirm that it is completely installed, and install three each of LS guides ❸ and screws ❷ respectively.
13) Install stopper washer ❶.
14) Use mode selector and confirm that loading and threading are being performed smoothly.
15) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

    Note:

    Perform the soldering rapidly.

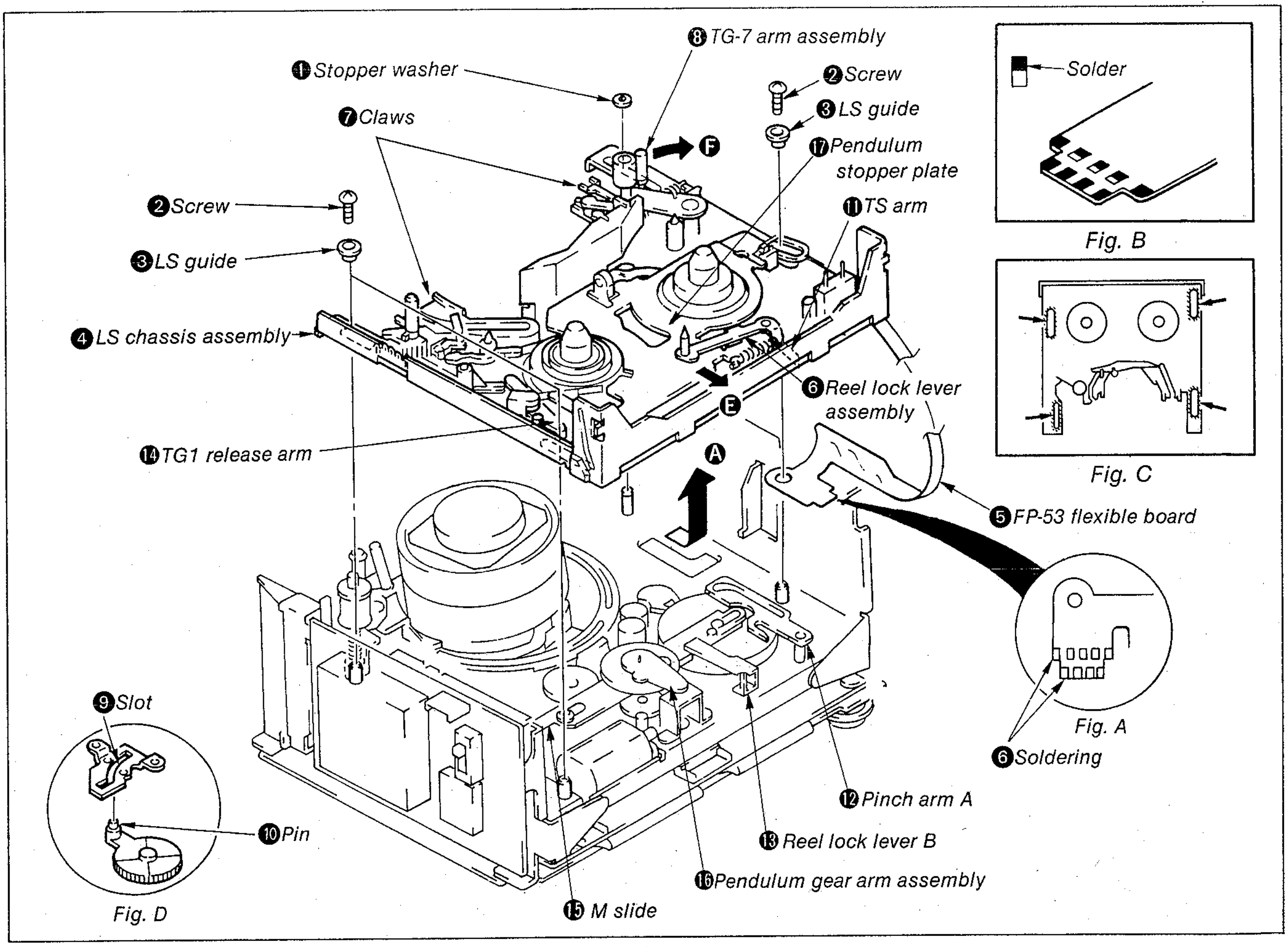

❽TG-7 arm assembly
❶Stopper washer
❷Screw
❸LS guide
❼Claws
Ⓕ
⓱Pendulum stopper plate
❷Screw
⓫TS arm
❸LS guide
❹LS chassis assembly
❻Reel lock lever assembly
Ⓔ
⓮TG1 release arm
Ⓐ
❺FP-53 flexible board
Solder
Fig. B
Fig. C
Fig. A
❻Soldering
❾Slot
❿Pin
Fig. D
⓬Pinch arm A
⓭Reel lock lever B
⓰Pendulum gear arm assembly
⓯M slide

Fig. 8-21.

8-3-11. TG-7 Arm Assembly (See Fig. 8-22)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) Turn over LS chassis assembly.
4) Remove stopper washer ❷ (t = 0.3mm).
5) Remove TG-7 spring ❷ from claw ❸, and remove TG-7 arm assembly ❹.

Note:

1) As the FP-53 flexible board ✻ is connected to the mechanical chassis, caution should be taken that it is not broken off.
2) Be careful not to deform the TG-7 arm.

2. Installation

1) Apply over 1/3 drop and below 1/2 drop of oil to the arrow section of shaft, as shown in Fig. A.
2) Install TG-7 arm assembly ❹ by way of TG-7 spring ❷.
3) Hook TG-7 spring ❷ onto claw ❸.
4) Install stopper washer ❶.
5) By referring to 8-3-10, install LS chassis assembly.
6) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.
7) Perform presetting of guide block height (Refer 8-4 TAPE PATH ADJUSTMENT).

Note:

Confirm that stopper washers ❶ is completely inserted into the notch of the shaft.

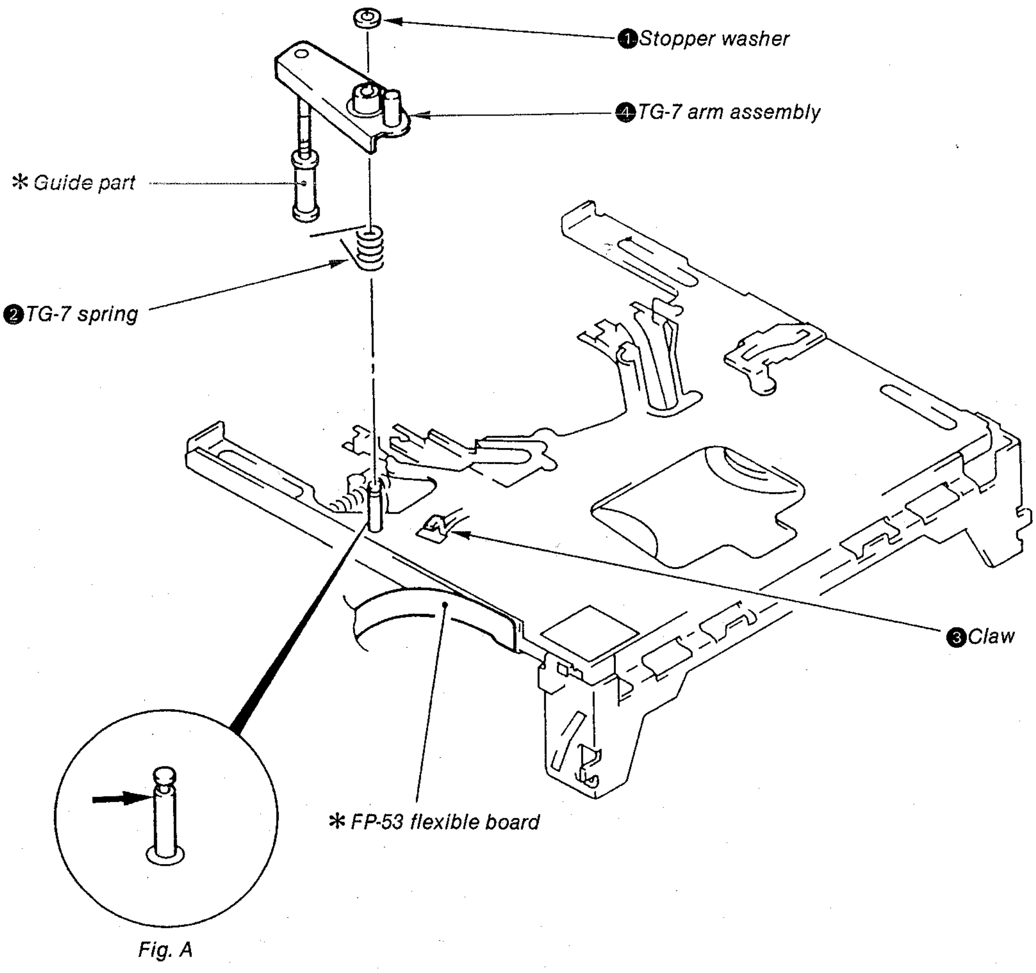


Fig. 8-22.

8-3-12. Pinch Arm A Assembly (See Fig. 8-23)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) Remove stopper washer ❶.
4) Remove pinch arm A assembly ❷.

2. Installation

1) Apply over 1/3 drop and below 1/2 drop of oil to arrow section of shaft, as shown in Fig. A.
2) Apply molten grease to arrow section of pinch arm A assembly ❷, as shown in Fig. B.
3) Insert pin of pinch arm A assembly ❷ into outer notch of cam assembly ❸, and install to shaft.
4) Install stopper washer ❶.
5) By referring to 8-3-10, install LS chassis assembly.
6) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

Note:
Confirm that stopper washer ❶ is completely inserted into shaft.

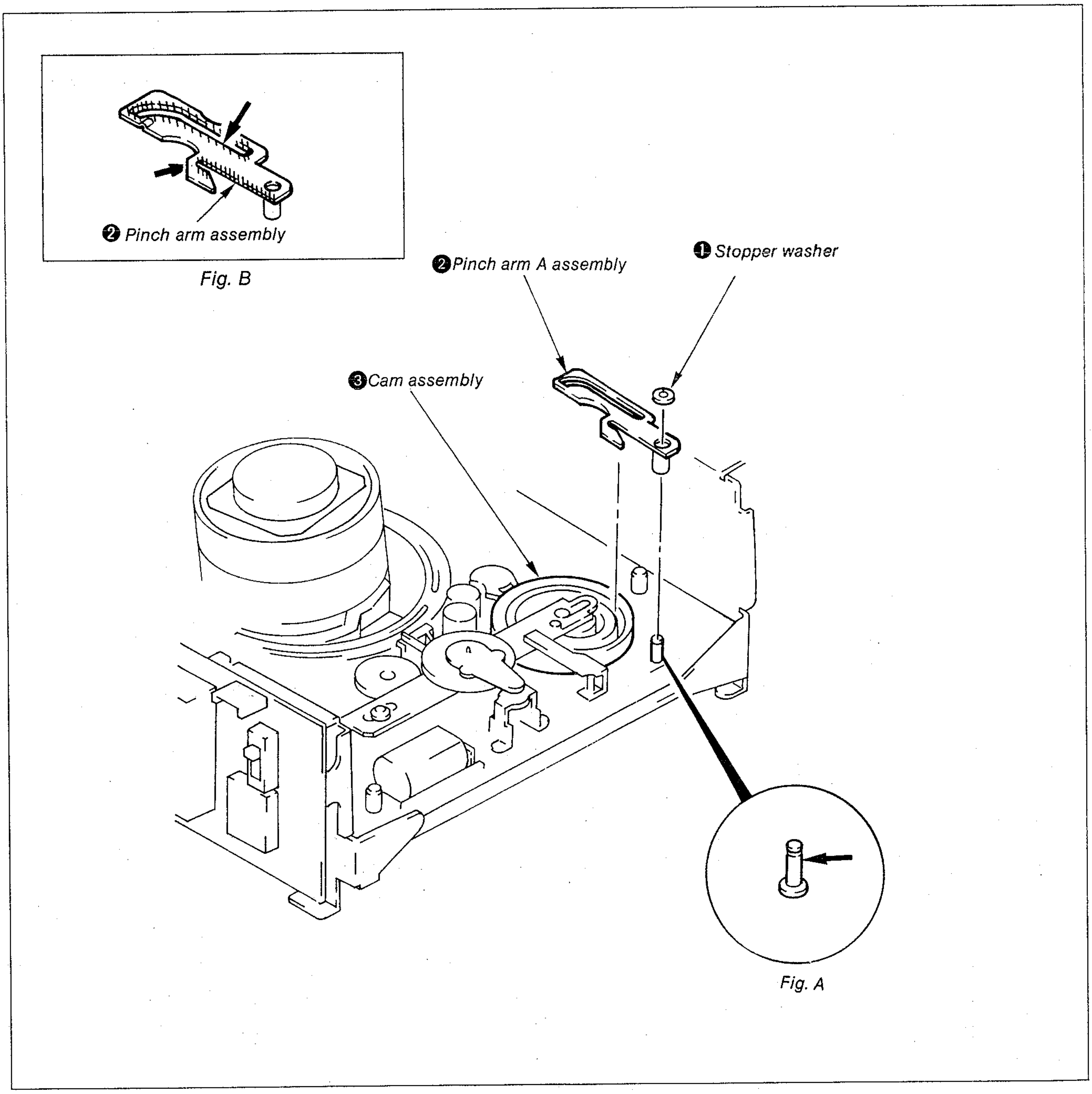


Fig. B

Fig. A

Fig. 8-23.

8-3-13. M Slider Assembly (See Fig. 8-24)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove the cassette arm assembly and LS cassette assembly.
2) By referring to 8-3-10, remove the LS chassis.
3) Remove pendulum gear arm.
4) Remove E ring ❷ and remove reel lock lever B ❸.
5) Remove stopper washer ❹.
6) Remove stopper washer ❺ and M slider assembly ❻.

2. Installation

1) Apply molten grease to the arrow marked point of M slider assembly ❻, as shown in Fig. A.
2) Insert pin of the M slider assembly ❻ into the inner notch of cam assembly ❼ and install.
3) Remove stopper washer ❺ and stopper washer ❹.
4) Apply molten grease to the arrow marked point of reel lock lever B ❸, as shown in Fig. B.
5) Apply over 1/3 drop and below 1/2 drop of oil to the arrow marked point on the shaft, as shown in Fig. C and E.
6) Install reel lock lever so as to be inserted in between the bent-up part and pin, as shown in Fig. D.
7) Install E ring ❷.
8) Apply over 1/3 drop and below 1/2 drop of oil to the shaft of relay base assembly ❾.
9) Install pendulum gear arm ❶.
10) By referring to 8-3-10, install LS chassis assembly.
11) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

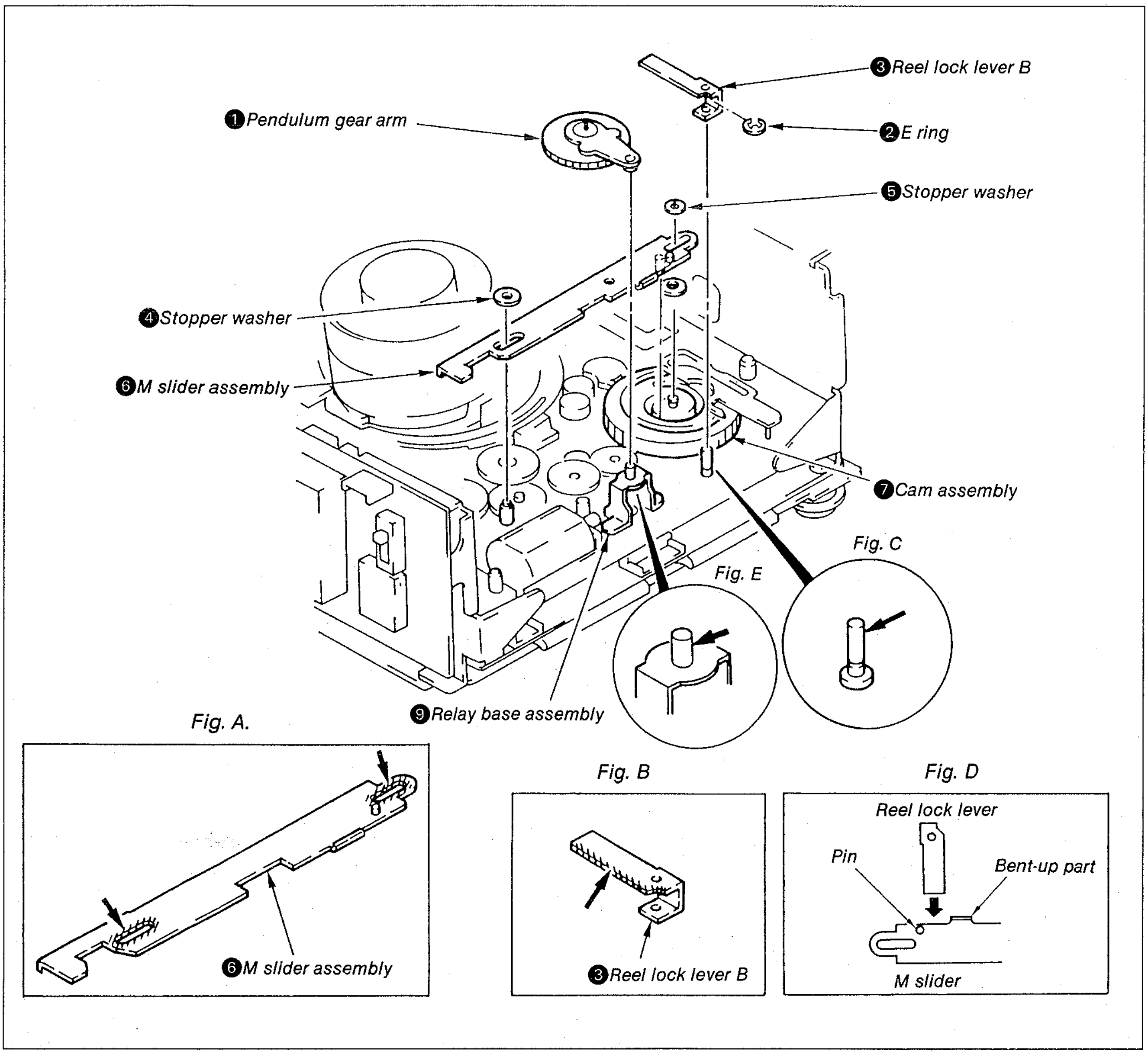

❸Reel lock lever B
❶Pendulum gear arm
❷E ring
❺Stopper washer
❹Stopper washer
❻M slider assembly
❼Cam assembly
Fig. C
Fig. E
❾Relay base assembly
Fig. A.
❻M slider assembly
Fig. B
❸Reel lock lever B
Fig. D
Reel lock lever
Pin
Bent-up part
M slider

Fig. 8-24.

8-3-14. TG-4 Base Assembly and TG-5 Base Assembly

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) Set into GUIDE LOAD mode and remove TG-4 base assembly ❶ and TG-5 base assembly ❷ from the groove of the drum base.
4) Remove the TG-4 base assembly from the notch ❸ by turning around section the upper of pin ❺ in the direction of arrow Ⓐ by centering pin ❹ of the TG-4 base assembly ❶. (See Fig. 8-25.)
5) Remove pin ❺ from the hole of notch ❸. .
6) Remove TG-5 base assembly ❷ from notch ❼ by moving it in the direction of arrow Ⓐ (See Fig. 8-26)
7) Remove TG-5 base assembly ❷ from pin ❻. (See Fig. 8-27)

   Note:

   Be sure not to contact with the guide section marked with *.

2. Installation

1) Insert pin ❻ into the hole of TG-5 base assembly ❷.
2) Insert TG-5 base assembly ❷ beneath notch ❼ by moving it in the direction of arrow B.
3) Insert pin ❺ of TG-5 base assembly ❶ into the hole of notch ❸.
4) Set pin ❹ of TG-4 base assembly ❶ into notch ❸ by turning it in the direction of arrow Ⓑ.
5) Confirm that the TG-4 base assembly ❶ and TG-5 base assembly ❷ have been installed in the states as shown in Fig. A and B respectively.
6) Set TG-4 base assembly ❶ and TG-5 base assembly ❷ into the groove of the drum base while slowly turning BLANK after GUIDE LOAD mode. If the position are not matched, the assembly is caught by the entrance of the groove and, accordingly, it may be unable to move. Therefore, be sure to set it into the groove while matching the positions very carefully.
7) By referring to 8-3-10, install LS chassis assembly.
8) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

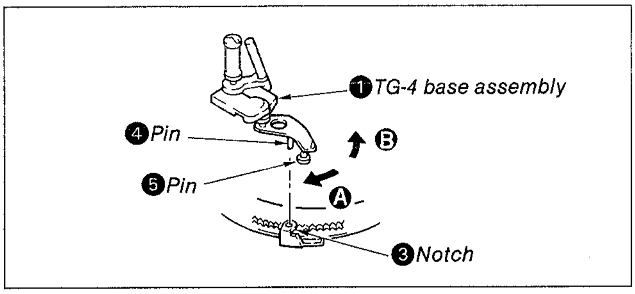


Fig. 8-25.

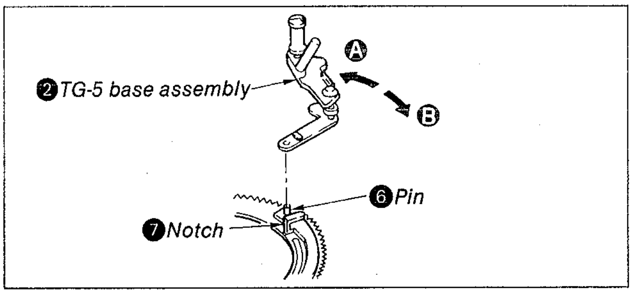


Fig. 8-26.

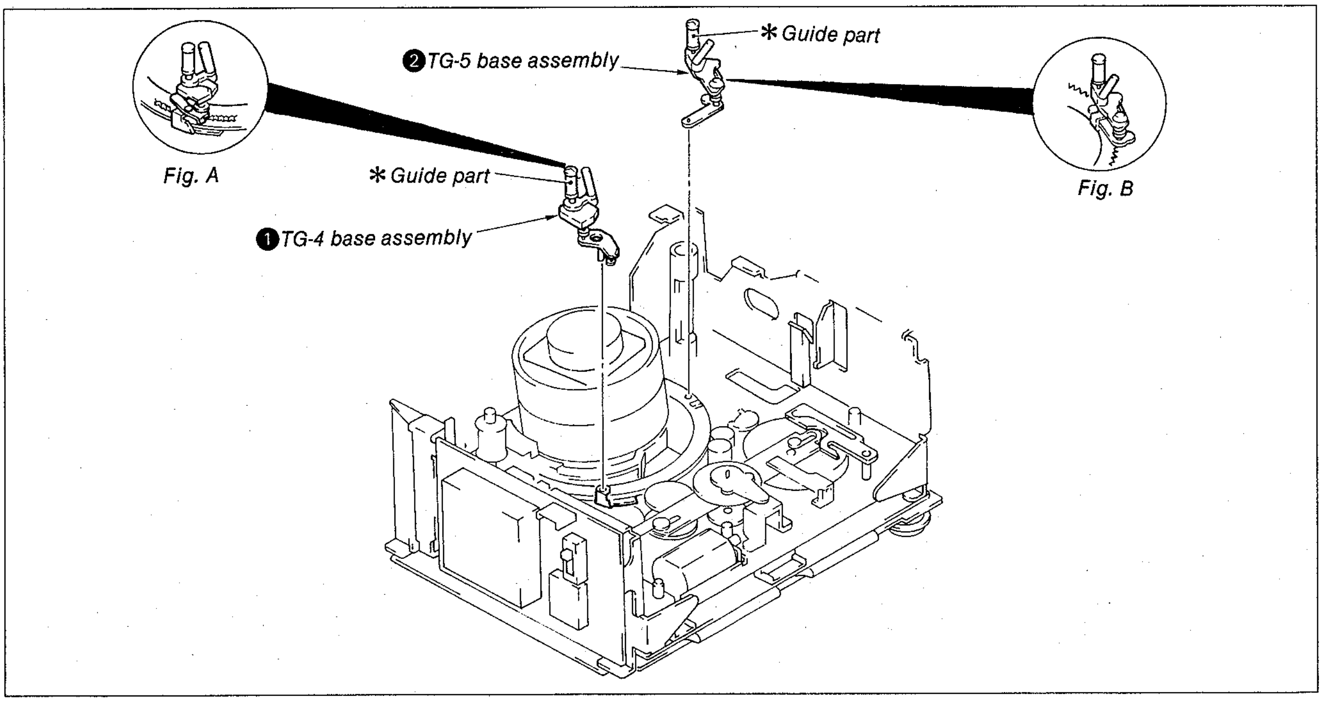


Fig. 8-27.

8-3-15. Loading Slider T Assembly (See Fig. 8-28)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) By referring to 8-3-14, remove TG-4 base assembly and TG-5 base assembly.
4) By referring to 8-3-24, remove drum unit.
5) Remove screw ①, and remove plate spring T ② and T slider stopper ③.
6) Remove screw ④ and remove slider supporter ⑤.
7) Remove two lock washers ⑥ and remove loading slider T assembly ⑦.

2. Installation

1) Apply molten grease to the arrow marked point of plate spring T ②, as shown in Fig. A.
2) Apply molten grease to the arrow marked point of loading slider T assembly ⑦, as shown in Fig. B.
3) Install loading slider T assembly ⑦ by matching hole ⑧ of the loading slider T assembly to hole ⑨ of the loading slider S assembly.
4) Install two locking washers ⑥.
5) Install slider supporter ⑤ with screw ④.
6) Install T slider stopper ③ and plate spring ② with screw ①.
7) By referring to 8-3-24, install drum unit.
8) By referring to 8-3-14, install TG-4 base assembly and TG-5 base assembly.
9) By referring to 8-3-10, install LS chassis assembly.
10) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

Notes:

1) Be sure to confirm that lock washer ② has been engaged completely into the groove of the shaft.
2) By referring to 8-3-17, perform phase adjustment after loading slider T assembly ⑦ is installed.

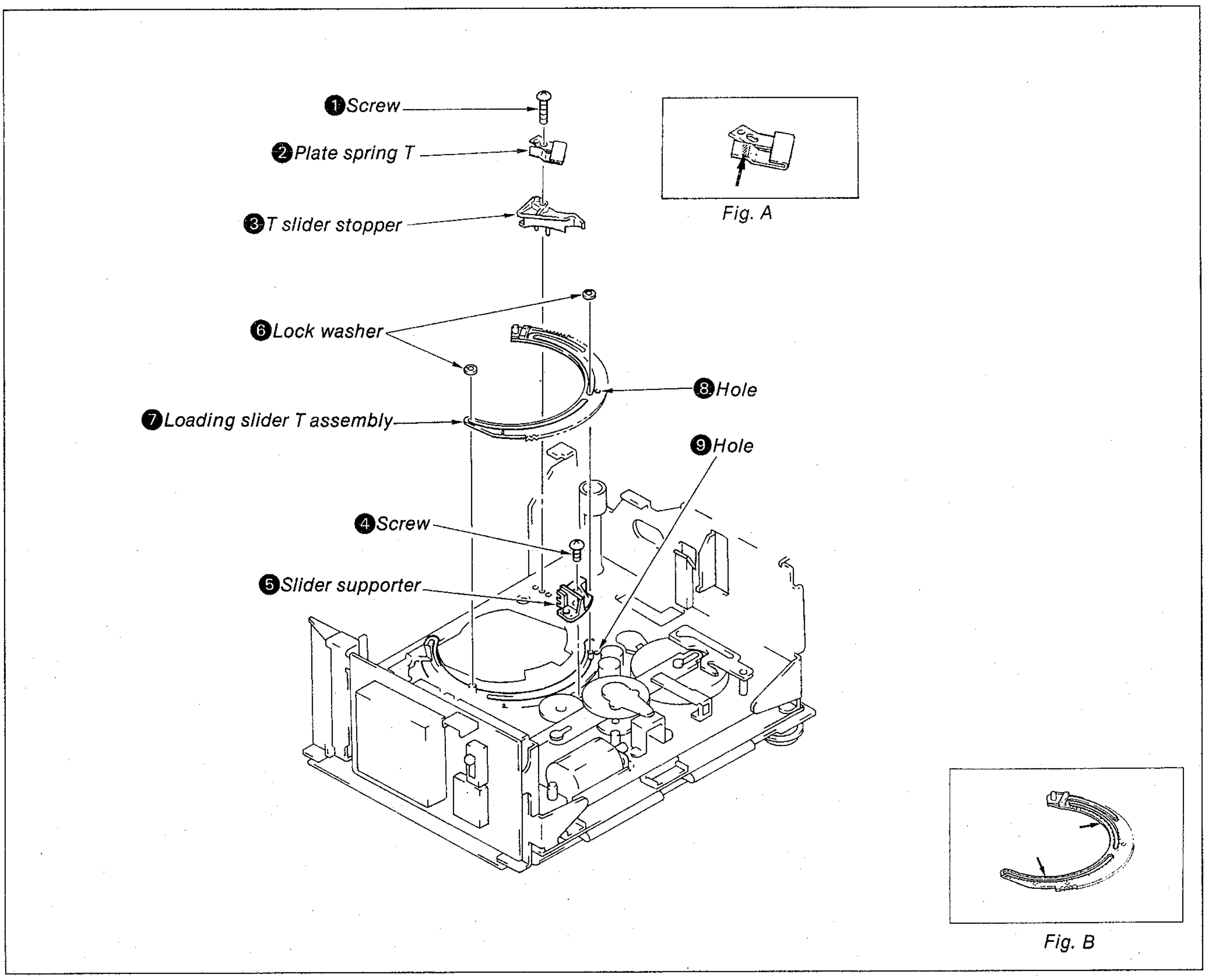


Fig. A

Fig. B

Fig. 8-28.

8-3-16. Loading Slider S Assembly (See Fig. 8-29)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) By referring to 8-3-14, remove TG-4 base assembly and TG-5 base assembly.
4) By referring to 8-3-24, remove drum unit.
5) By referring to 8-3-15, remove loading slider T assembly.
6) Remove screw ❶ and remove S slider stopper ❷.
7) Remove two guide rollers ❸ and remove loading slider S assembly ❹.

2. Installation

1) Apply a little molten grease to the arrow marked two point of shaft ❺, as shown in Fig. A.
2) Apply molten grease to the arrow marked point of loading slider S assembly ❹, as shown in Fig. B.
3) Install loading slider S assembly ❹ by matching hole ❻ of loading slider S assembly to hole ❼ of the mechanical chassis.
4) Install two guide rollers ❸.
5) Install S slider stopper ❷ with screw ❶.
6) By referring to 8-3-15, install loading slider T assembly.
7) By referring to 8-3-24, install drum unit.
8) By referring to 8-3-14, install TG-4 base assembly and TG-5 base assembly.
9) By referring to 8-3-10, install cassette arm assembly and LS cassette compartment assembly.
10) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

Note:

By referring to 8-3-17, perform phase adjustment after loading slider T assembly has been installed.

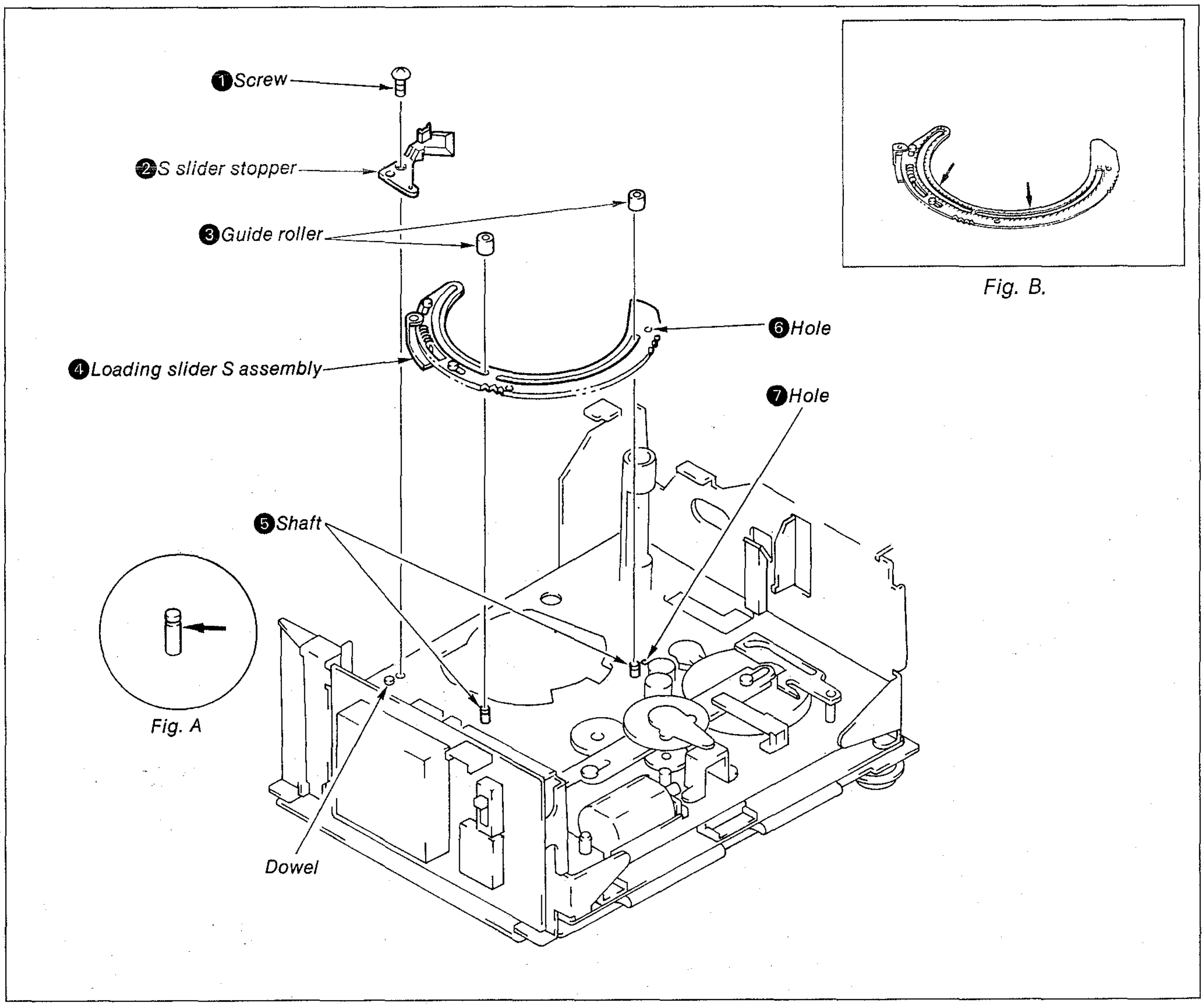


Fig. 8-29.

8-3-17. Phase Adjustment (See Fig. 8-30)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis.
3) By referring to 8-3-14, remove TG-4 base assembly and TG-5 base assembly.
4) By referring to 8-3-24, remove drum unit. (See Fig. 8-30)
5) Remove the stopper washer ❿ and then remove the loading gear S ❻.
6) Remove the stopper washer ❽ and the LS gear A ❼.

2. Adjustment

1) Confirm that it has been turned into BLANK after GUIDE LOAD mode.
2) Adjust the positions of the respective holes of loading slider T assembly ❷, loading slider S assembly ❸, and the mechanical chassis, and then insert a rod ❶ of approximately 1mm in diameter into the holes.
3) Adjust the position of the hole of LS gear C assembly and the position of the hole of the mechanical chassis, and insert rod ❶ of approximately 1mm in diameter into the holes.
4) Adjust by turning loading gear M ❺ so that the notch portion on it comes to the loading gear S ❻ side, as shown in Fig. A.
5) As shown in Fig. B, align the hole of the loading slider T assembly ❷ with that of the LS gear A ❼, and mount the LS gear A ❼.
6) Install stopper washer ❽.
7) Remount the loading gear S ❻, and then install, the stopper washer ❿.

Note:
Be sure to confirm that stopper washer ❽ and ❿ are set completely in the groove of the shaft.

3. Installation

1) Similarly to Fig. C, apply grease (one drop equivalent to a grain of rice) to the five positions on the internal grove of the cam assembly ❾.
2) By referring to 8-3-25, install drum unit.
3) By referring to 8-3-14, install TG-4 base assembly and TG-5 base assembly.
4) By referring to 8-3-10, install LS chassis assembly.
5) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette assembly.

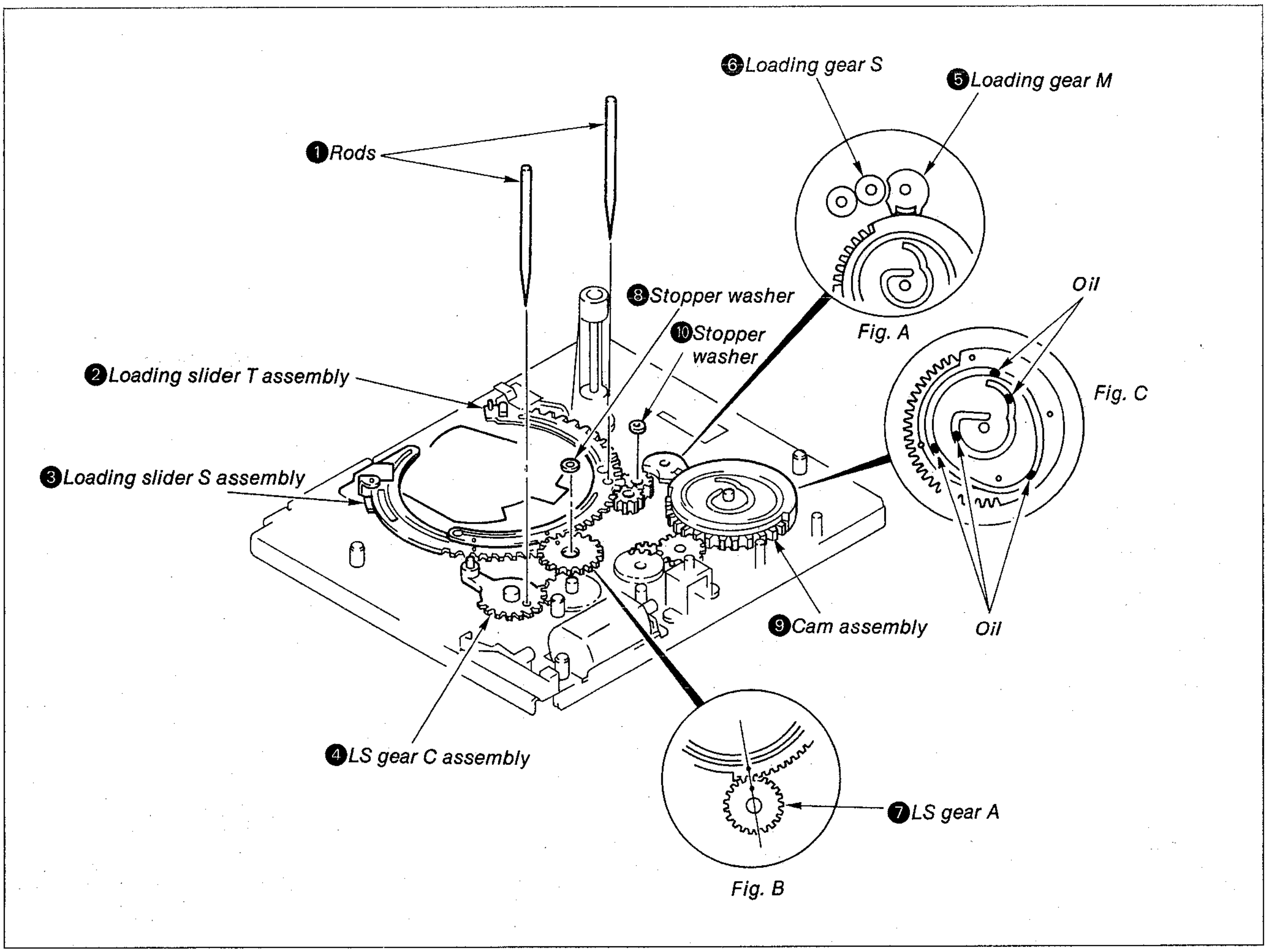

❻Loading gear S
❺Loading gear M
❶Rods
❽Stopper washer
❿Stopper washer
Fig. A
Oil
Fig. C
❷Loading slider T assembly
❸Loading slider S assembly
❾Cam assembly
Oil
❹LS gear C assembly
❼LS gear A
Fig. B

Fig. 8-30.

8-3-18. Gear Train Operation Check (See Fig. 8-31)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) By referring to 8-3-14, remove TG-4 base assembly and TG-5 base assembly.
4) By referring to 8-3-24, remove drum unit.
5) By referring to 8-3-21, remove LM motor assembly.

2. Checking

1) Insert a point of tweezers into the hole of the cam assembly ❶.
2) Rotate the cam assembly ❶ once around in the direction of arrow Ⓐ, and then once around in the direction of arrow Ⓑ. Repeat the above three times.
3) At this point, confirm that the individual gears and sliders shown in Fig. are being operated smoothly, and there are no abnormal loading.

Note:

When making cam assembly ❶ to rotate with the point of tweezers, exercise cautions so as not to cause flaw to the mechanical chassis.

3. Installation

1) By referring to 8-3-21, install LM motor assembly.
2) By referring to 8-3-24, install drum unit.
3) By referring to 8-3-14, install TG-4 base assembly and TG-5 base assembly.
4) By referring to 8-3-10, install LS chassis assembly.
5) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

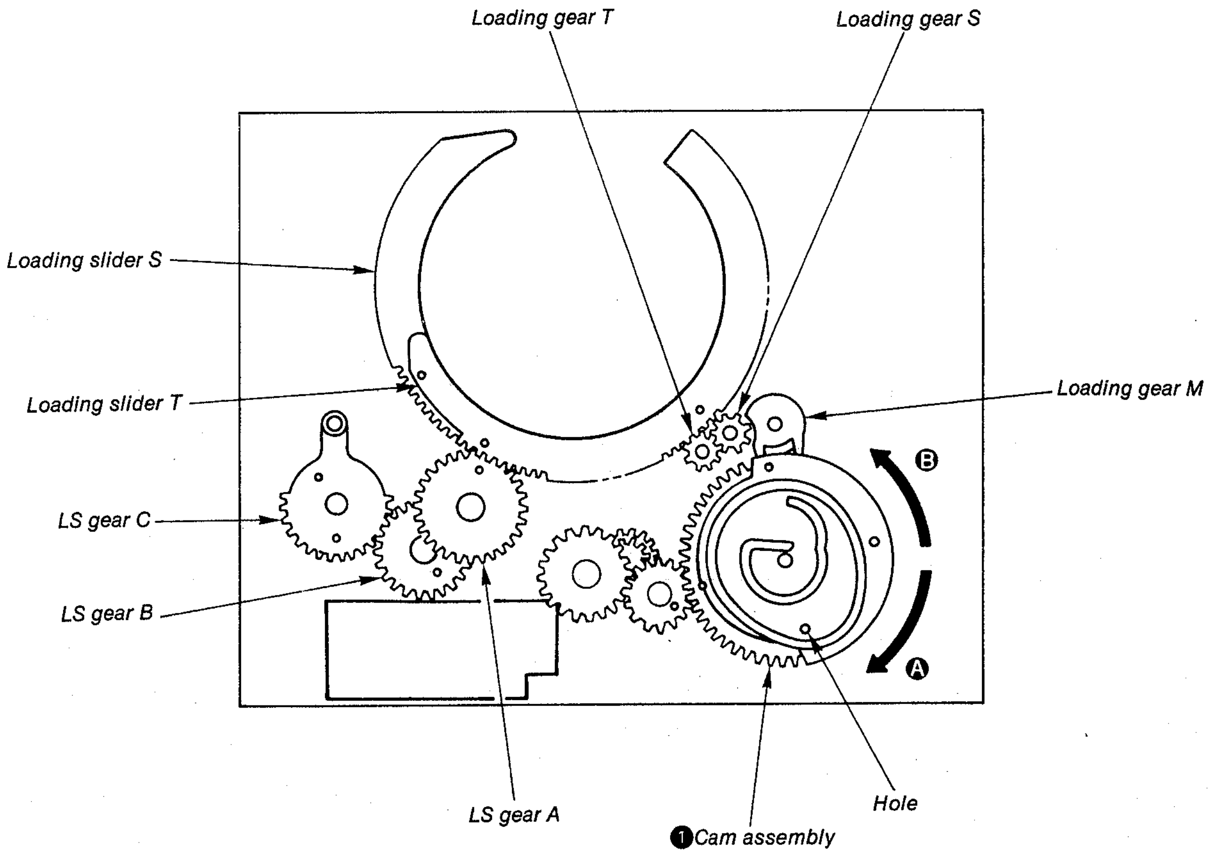


Fig. 8-31.

8-3-19. FP-53 Flexible Board (See Fig. 8-32)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) By referring to 8-3-4, remove T reel table assembly.
4) By referring to 8-3-3, install S reel assembly.
5) Remove two claws ❶ and lift the push switch. Then, peel off the flexible board ❷ stuck to the LS chassis.

   Note:

   When peeling off FP-53 flexible board ❷, care must be taken so as not to tear it.

2. Installation

1) Clean the joint section of the LS chassis assembly and the FP-53 flexible board ❷ with a cleaning liquid.
2) Peel off the sheet covering of the adhesion tape on the rear side of a new FP-53 flexible board ❷ and match the shaft hole to shaft ❸ of the LS chassis and claw, and thus the tape is adhered.
3) Adjust dowel ❺ (two positions) and install it with claw ❶, and match hole of FP-53 flexible board ❷ to dowel ❻.
4) By referring to 8-2-3,
5) By referring to 8-3-4, install T reel table assembly.
6) By referring to 8-3-10, install LS chassis assembly.
7) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

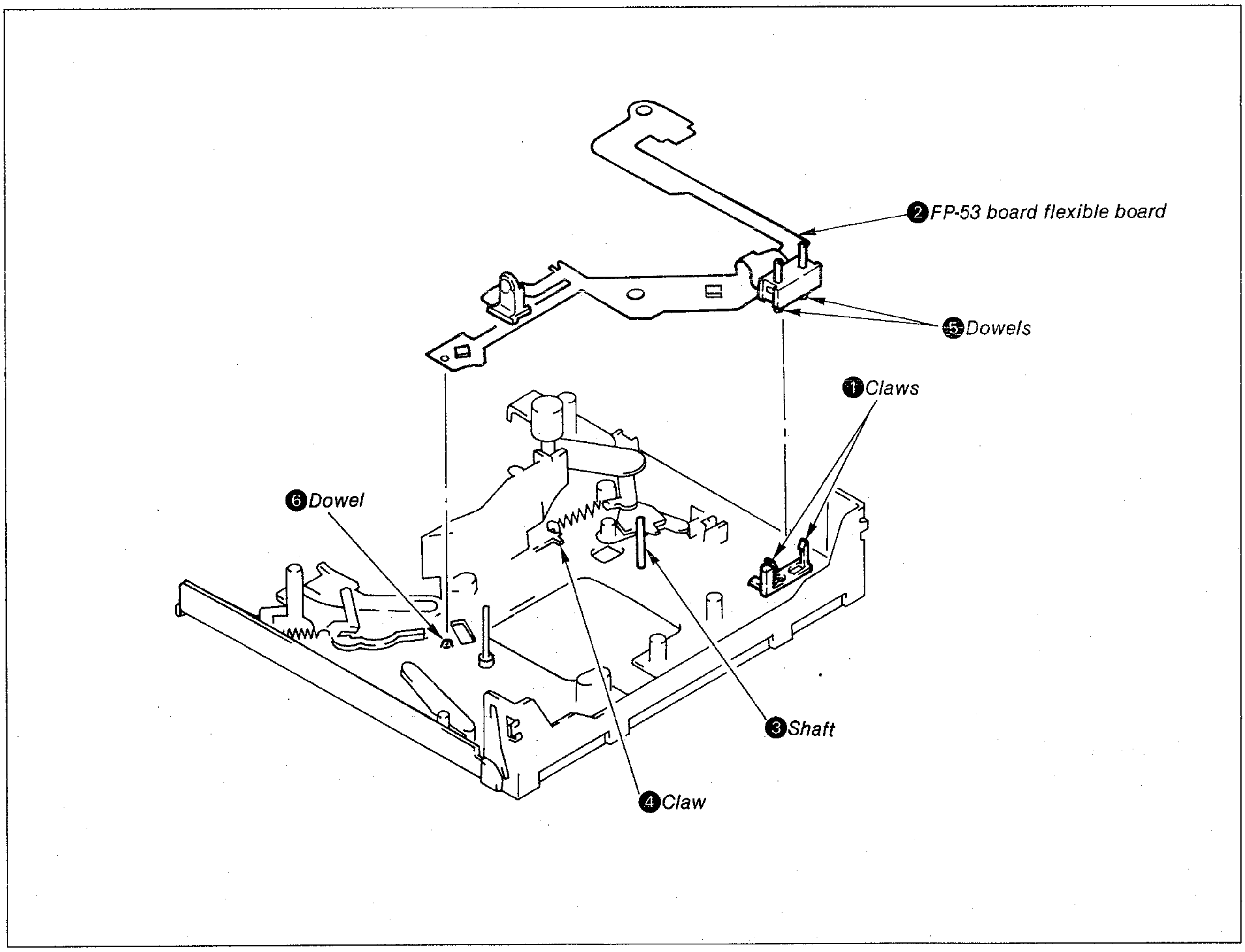


Fig. 8-32.

8-3-20. Cassette Compartment Lock Assembly (See Fig. 8-33)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-10, remove LS chassis assembly.
3) Remove screw ❶ and screw ❷, and remove cassette compartment lock assembly ❸.
4) Remove screw ❹ and remove CCD SW ❺.

2. Installation

1) Install CCD SW ❺ with screw ❹.
2) Match cassette compartment lock assembly ❸ to dowel ❻, and install.
3) Install screw ❷ loosely and then tighten screw ❶ and screw ❷ successively in this order.
4) By referring to 8-3-10, install LS chassis assembly.
5) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

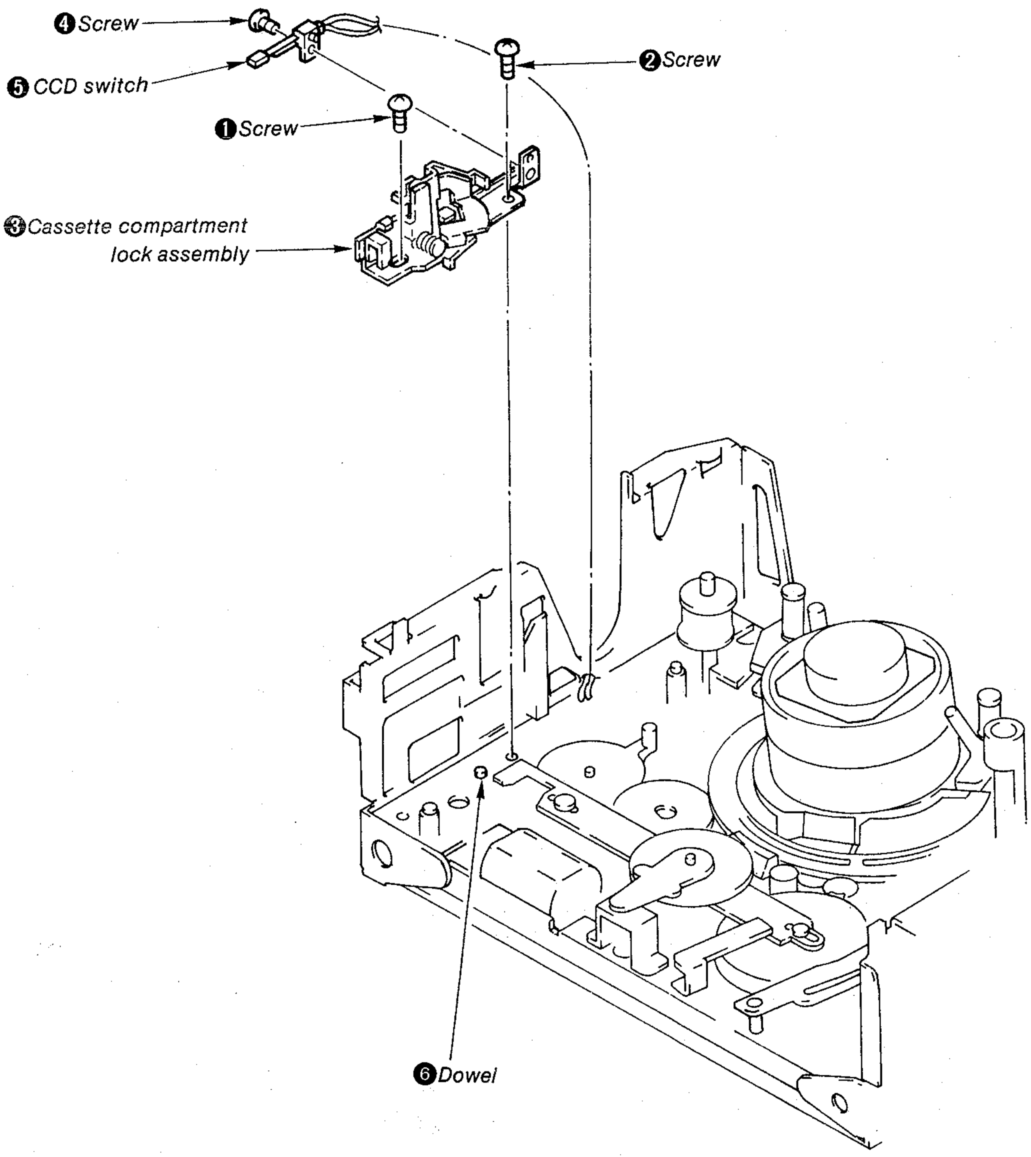

❹Screw
❺CCD switch
❶Screw
❷Screw
❸Cassette compartment lock assembly
❻Dowel

Fig. 8-33.

8-3-21. LM Motor Assembly (See Fig. 8-34)

1. Removal

1) By referring, Section 2 DISASSEMBLY, 2-6 Opening the SS-70 board.
2) Remove screws ❶, ❷ and ❸, and remove the LM motor assembly ❹ in the direction of arrow Ⓐ.
3) Remove two screws ❺ and disassemble motor holder assembly ❻ and DC motor ❼.
4) Remove stopper washer ⓭ and remove worm wheel ❿ from shaft ❽.
5) Remove the solder of the two cords ⓫ coming out from the DC motor ❼ and remove the DC motor ❼ from the mechanical chassis.

2. Installation

1) Solder the two cords coming out from the DC motor ❼ which is shown in Fig. A, to the two points as shown in Fig. A.
2) Apply 1/3 drop of oil onto shaft ❽ and install a worm wheel A ❿.
3) Apply a size of one rice grain of grease to worm ❾.
4) Install motor holder assembly ❻ and DC motor ❼.
5) Install motor holder assembly ❻ to pin ⓬ of the mechanical chassis by matching the hole of it.
6) Tighten the screws ❸, ❷ and ❶ in that order.

Note:

- Be sure to perform the soldering at 260°C within 5 seconds.
- Pull out the cord coming from the DC motor ❼ lest it should sag over the chassis.

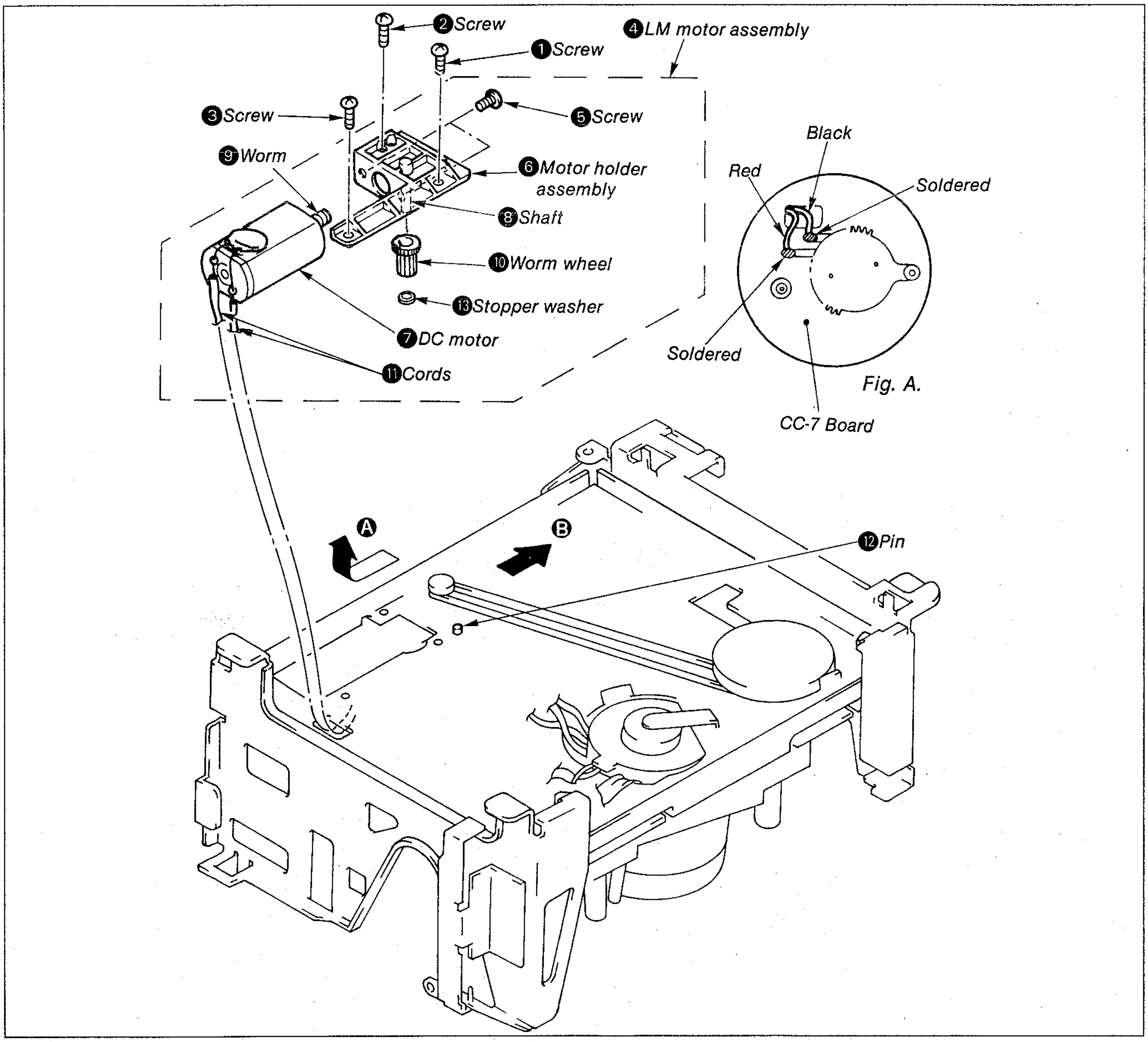

❷Screw
❶Screw
❹LM motor assembly
❸Screw
❺Screw
❾Worm
❻Motor holder assembly
❽Shaft
❿Worm wheel
⓭Stopper washer
❼DC motor
⓫Cords
Black
Red
Soldered
Soldered
Fig. A.
CC-7 Board
Ⓐ
Ⓑ
⓬Pin

Fig. 8-34.

8-3-22. Capstan Motor Assembly (See Fig. 8-35)

1. Removal

1) By referring Section 2 DISASSEMBLY, 2-6 opening the SS-70 board.
2) Remove screws ❶ and ❷, and remove capstan motor assembly ❺.
3) Remove stopper washer ❻ and conversion gear assembly ❼, and remove relay belt ❸.

Note:

Do not touch the capstan motor shaft marked with ✻ oil seal marked with ✻ and rotor marked with ✻.

2. Installation

1) As shown in Fig. A. apply over 1/3 drop and below 1/2 drop of oil to the arrow marked point of shaft ❽.
2) Install conversion gear assembly ❼ to shaft ❽ while applying relay belt ❸ to the assembly.
3) Install stopper washer ❻.
4) Install capstan motor assembly ❺ to mechanical chassis while applying relay belt ❸ to pulley ❹.
5) Be sure to confirm that the capstan motor and mechanical chassis become horizontal, and install them with screws ❶ and ❷ successively in that order.

Notes:

1) Be sure to confirm that stopper washer ❻ is being set completely into the groove of shaft ❽.
2) Care should be taken so as not to leave the relay belt ❸ in the stretched state.

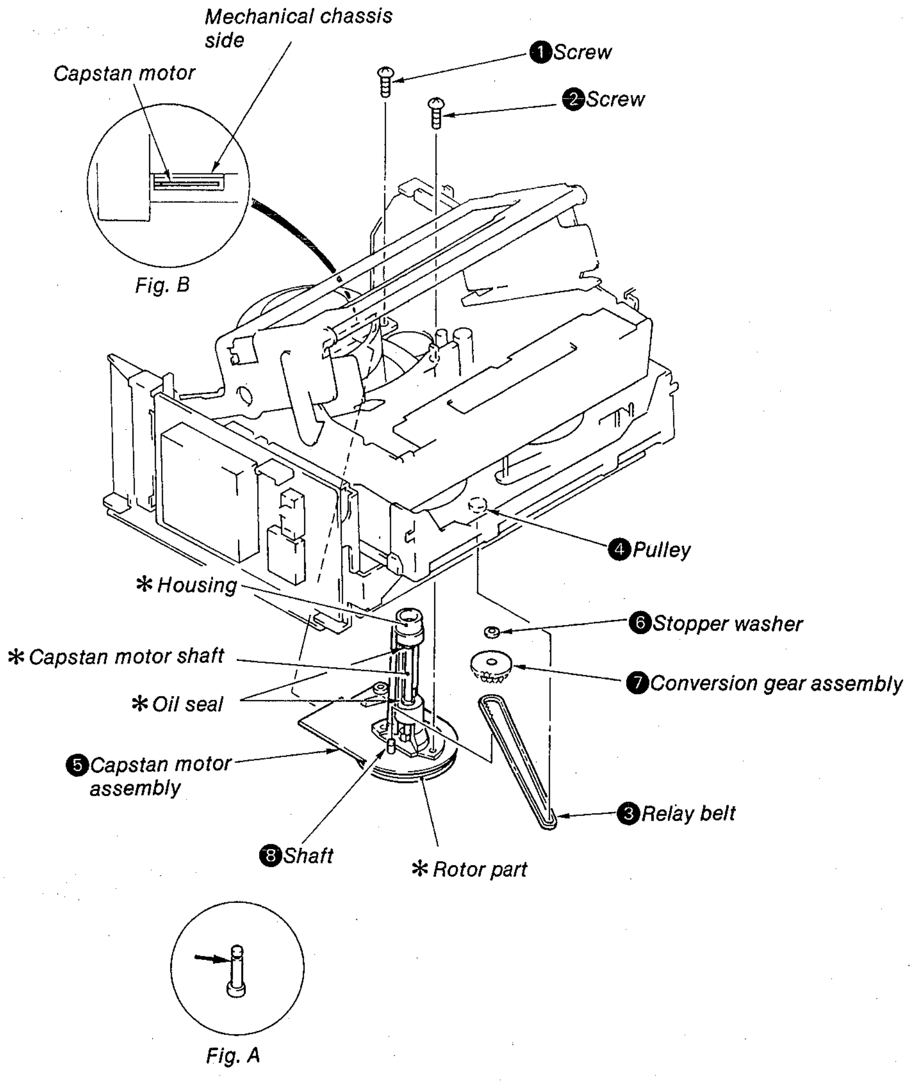

Mechanical chassis side
Capstan motor
Fig. B
❶Screw
❷Screw
❹Pulley
✻ Housing
✻ Capstan motor shaft
✻ Oil seal
❺Capstan motor assembly
❻Stopper washer
❼Conversion gear assembly
❸Relay belt
❽Shaft
✻ Rotor part
Fig. A

Fig. 8-35.

8-3-23. TG-2 (See Fig. 8-36)

1. Removal

1) Remove TG-2 nut ❶.
2) Remove upper flange receptacle ❷. TG-2 flange ❸. TG-2 roller ❹. TG-2 sleeve ❺. TG-2 flange ❻. TG-2 lower flange receptacle ❼ and pressure coil spring ❽.

Notes:

1) When removing TG-2 nut ❶, taken precautions not to scatter the parts which are being pressed by the pressure coil spring ❽.
2) Be sure to use gloves when installing and removing TG-2 flange ❸ and TG-2 roller ❹.

2. Installation

1) Install pressure coil spring ❽. Upper flange receptacle ❼, TG-2 lower flange ❻. TG-2 sleeve ❺. TG-2 roller ❹. TG-2 flange ❸ and upper flange receptacle ❷.
2) Install TG-2 nut ❶.
3) Perform TG-2 height preset.

3. TG-2 height preset

1) Push up upper flange receptacle ❾ in the direction of arrow as shown in Fig. A.
2) Screw TG-2 nut ❶ into TG-2 shaft ❿ until slit part heigh becomes the same level of the upper surface of TG-2 shaft ❿.
3) Rotate TG-2 nut ❶ 1/2 times in the direction of arrow as shown in Fig. B.

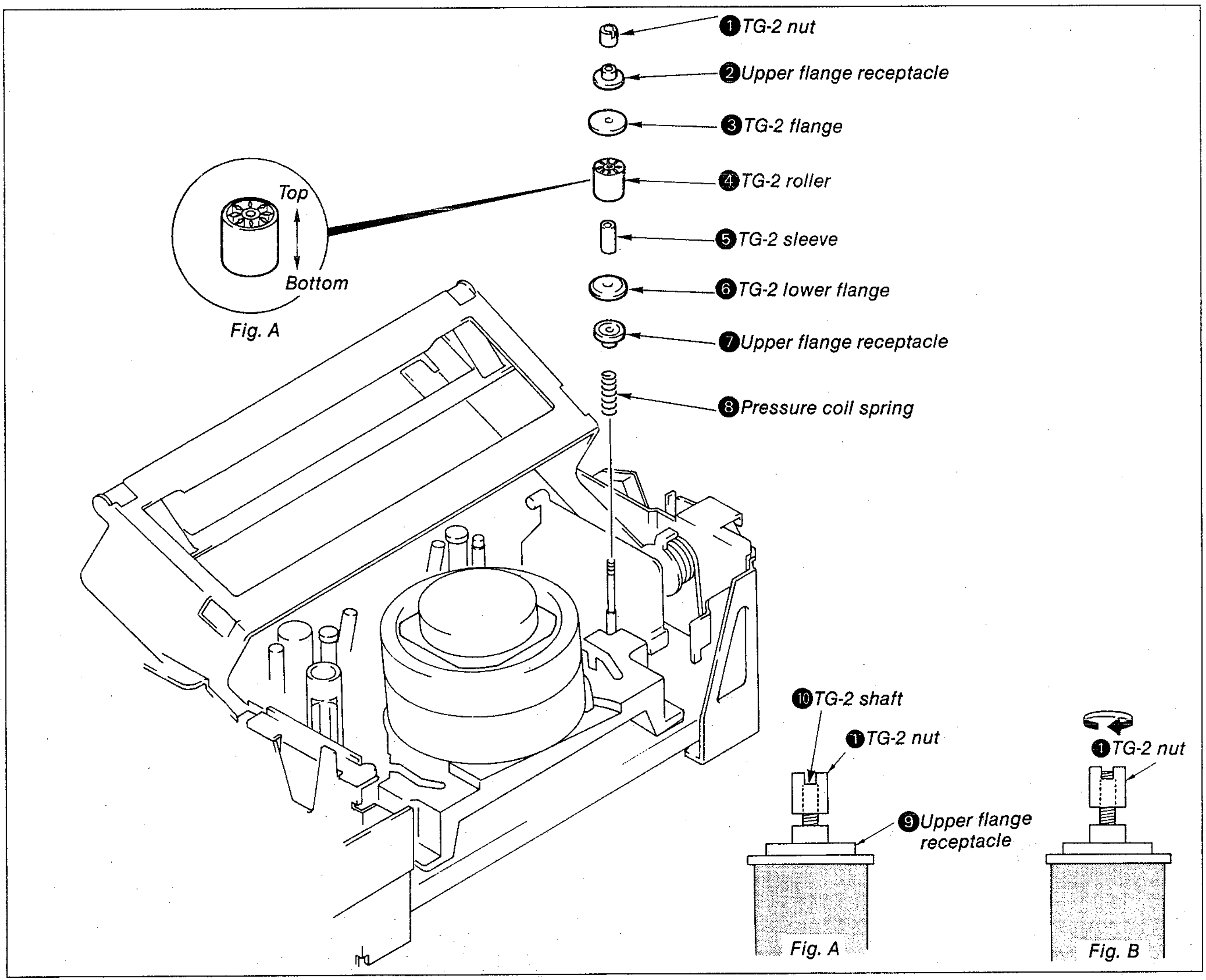

❶TG-2 nut
❷Upper flange receptacle
❸TG-2 flange
❹TG-2 roller
❺TG-2 sleeve
❻TG-2 lower flange
❼Upper flange receptacle
❽Pressure coil spring
Top
Bottom
Fig. A
❿TG-2 shaft
❶TG-2 nut
❾Upper flange receptacle
Fig. A
❶TG-2 nut
Fig. B

Fig. 8-36.

8-3-24. Drum Unit (See Fig. 8-37)

1. Removal

1) Turn into EJECT mode.
2) By referring, Section 2 DISASSEMBLY, 8-6 open SS-70 board and remove two connectors ❶.
3) Remove two connectors ❷ from MR-8 board.
4) Remove two screws ❸ and a screw ❹, and remove drum base ❺ and dew condensation sensor ❻.
5) Remove three screws ❻ and three washers ❼, and remove drum unit ❽.

2. Installation

1) Install drum unit ❽ to drum base ❺ and set three screws ❻.
2) Mount drum base ❺ on the mechanical chassis and secure it with two screws ❸.
3) Tighten dew condensation sensor ❻ and drum base ❺ with screw ❹.

Note:

Be sure not to use screws ❸ and ❹ again after they have once been loosened.

4) Apply molten grease to the arrow marked point, as shown in Fig. A.
5) Install two connectors ❶ to SS-70 board.
6) Install two connector ❷ to MR-8 board.
7) By referring, Section 2 DISASSEMBLY, 2-6, install SS-70 board.
8) Perform tape path adjustment in item 8-4.

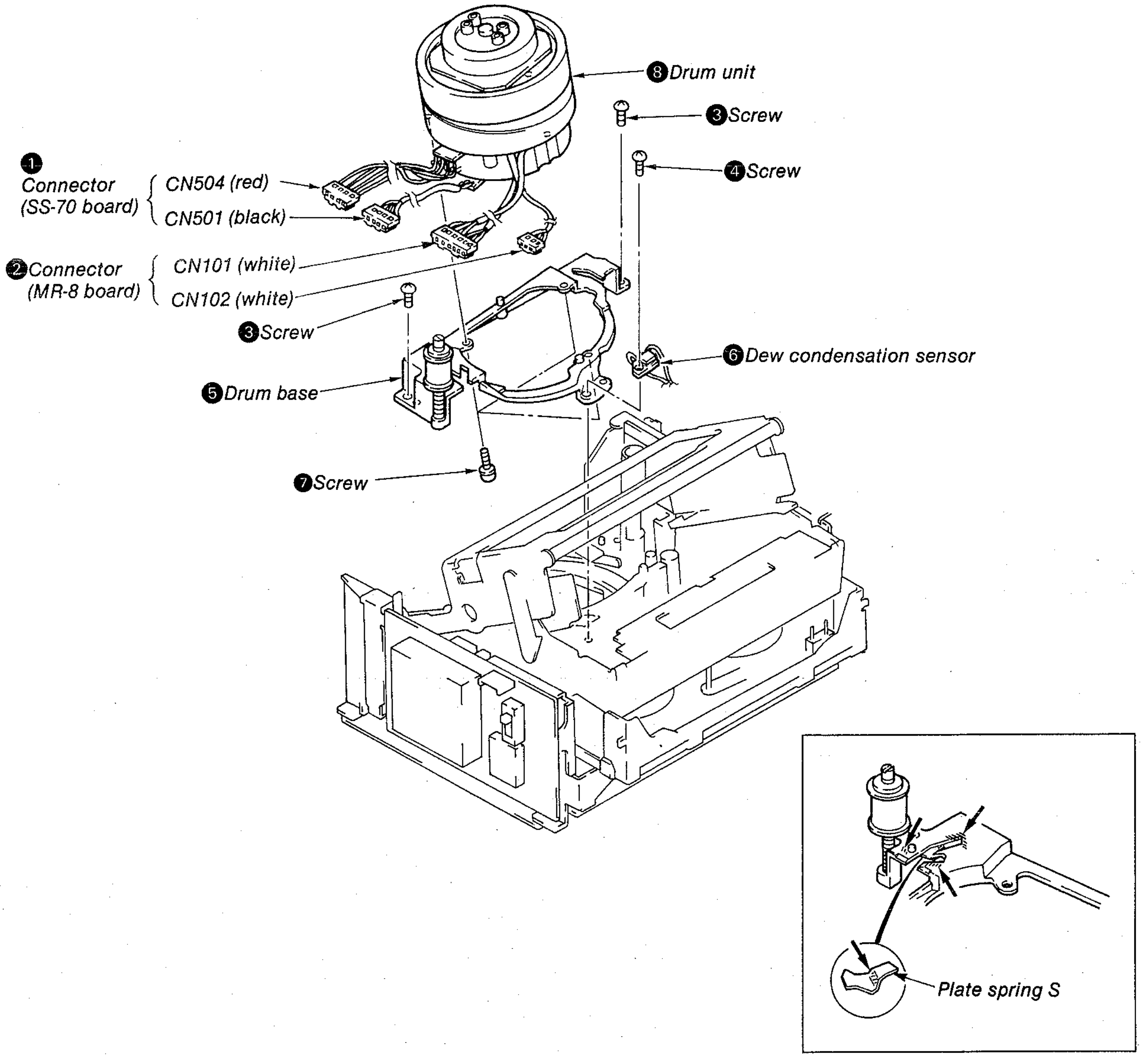

❽Drum unit
❸Screw
❹Screw
❶ Connector (SS-70 board) CN504 (red)
CN501 (black)
❷Connector (MR-8 board) CN101 (white)
CN102 (white)
❸Screw
❻Dew condensation sensor
❺Drum base
❼Screw
Plate spring S
Fig. A

Fig. 8-37.

8-3-25. Replacement of Rotary Upper Drum

1. Removal

- If video recording is possible, make video recording prior to the removal.

1) Remove two hexagonal socket head cap screws ❶ and damper ❷.
2) Remove all the six points of soldering in ⓐ section, and confirm that the board and pins which are projected from the lower side of the board can be moved freely by touching with tweezers, etc.
3) Remove two hexagonal socket head cap screws ❶. (See Fig. 8-39)
4) Install jig ❻ (Ref No. J-10) with the attached two screws ❹ into the screw hole where the damper ❷ had been installed and twist the attached hexagonal socket head cap screw ❺ into jig ❻. By doing so, the rotary drum becomes floated to the top side and this acts to remove the rotary upper drum ❼. (See Fig. 8-38.)

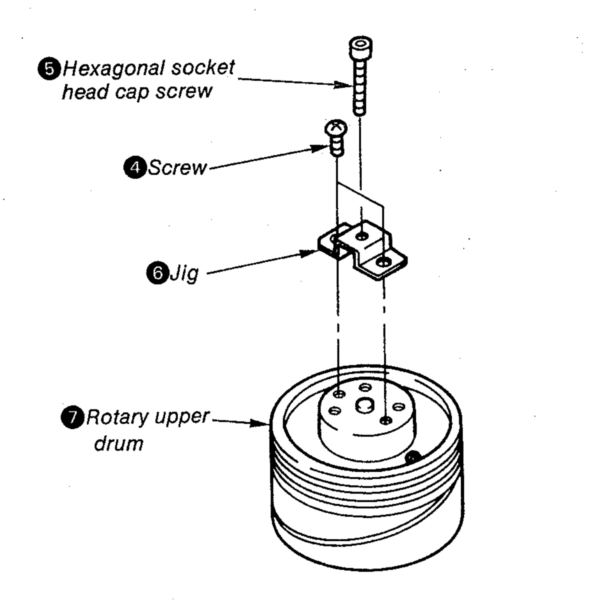

❺Hexagonal socket head cap screw
❹Screw
❻Jig
❼Rotary upper drum

Fig. 8-38.

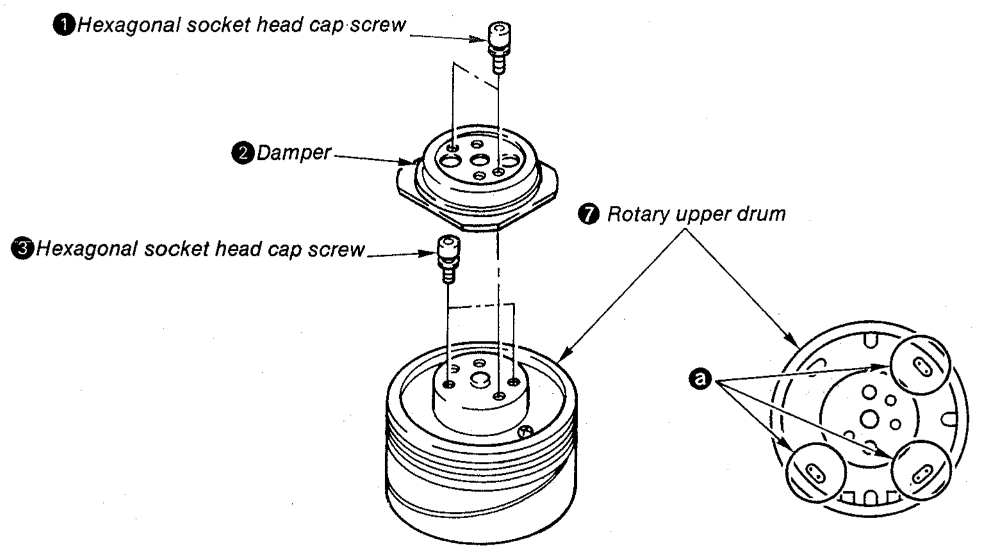

❶Hexagonal socket head cap screw
❷Damper
❸Hexagonal socket head cap screw
❼ Rotary upper drum
ⓐ

Fig. 8-39.

2. Installation

1) Perform cleaning of flange surface and rotary upper drum ❼ surface which are contacted to it, and confirm that there are no dust and flaws.
2) Insert jig ❾ (Ref No. J-10) of the rotary upper drum ❼ into the position determining hole and set it lightly to the rotary upper drum.

   Note:

   At this point, be sure to confirm that pin ❿ appears from the hole of the board on which the rotary upper drum is mounted. (Fig. 8-40).
3) Remove jig ❾ from upper rotary drum ❼ and push it gently into lower one manualy. However, when it cannot be inserted thoroughly, tighten two hexagonal socket head cap screws ❸ alternately to secure it temporarily.
4) Insert jig ❾ again into position determining hole ❽, and be sure to confirm that it can be inserted smoothly.

   When it cannot be inserted, loosen two hexagonal socket head cap screws ❸, and by referring to Removal 3), set it again.
5) Tighten two hexagonal socket head cap screws ❸.
6) Solder pin ❿ of a section.

   Note:

   At this point, be sure not to let the soldering flow underneath the board.
7) Install damper ❷ with two hexagonal socket head cap screws ❶.

   Notes:

   1) Be sure not to tighten too strongly.
   2) When performing installation, special care should be taken so as not to mistake the hexagonal socket head cap screws ❸ (2 × 5) with that of ❶ (2 × 2.7).
   3) Be sure to perform 8-4 tape path adjustment after installation.

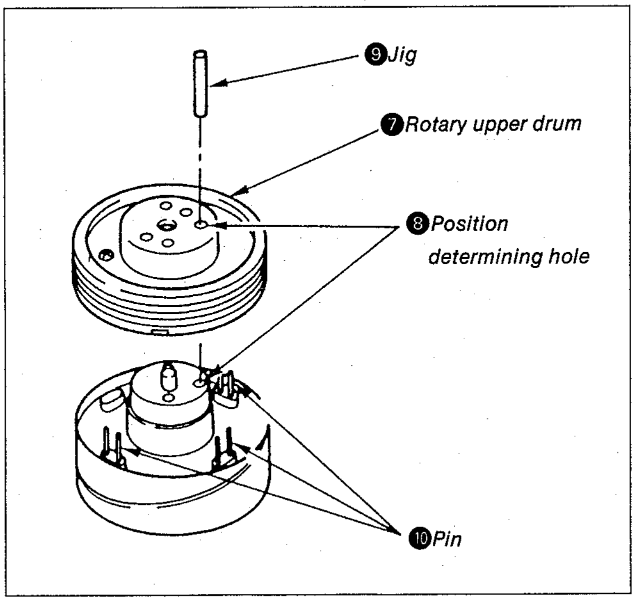


Fig. 8-40.

8-3-26. Reel Table Height Check (See Fig. 8-41)

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.
2) By referring to 8-3-1, remove reel lock lever.
3) By referring to 8-3-2, remove pendulum stopper plate.

2. Checking

1) Confirm by using calipers, etc., so that the heights from LS chassis ❶ to S reel table reel receptacle plate surface ❷ and from LS chassis to T reel table reel receptacle plate surface ❸ should respectively be 6.85 ± 0.15mm.

3. Installation

1) By referring to 8-3-2, install pendulum stopper plate.
2) By referring to 8-3-1, install reel lock lever assembly.
3) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

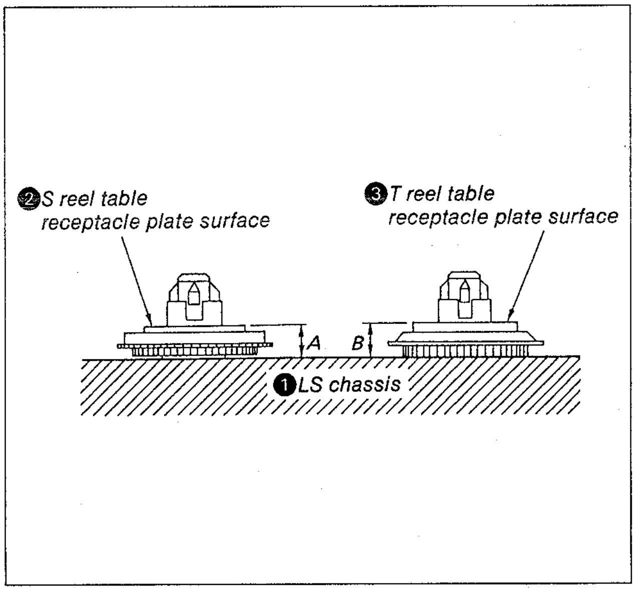

❷S reel table receptacle plate surface
❸T reel table receptacle plate surface
A
B
❶LS chassis

Fig. 8-41.

8-3-27 FWD/RVS Torque Check

1) Set the FWD and RVS take up torque cassette (Ref. No. J-9).
2) Turn into FWD mode, and confirm torque value at the T reel side becomes 11 gcm to 19 gcm.
3) Turn into REC REVIEW mode, and confirm torque value at the S reel side becomes 20 gcm to 32 gcm.
4) In the event the above-mentioned value are not indicated, be sure to replace the individual reel tables.

8-3-28 Tension Regulator Position Adjustment

1. Removal

1) By referring to 8-1-1 and 8-1-2, remove cassette arm assembly and LS cassette compartment assembly.

2. Adjustment

1) Set a cassette tape and turn into $\boxed{\text{REC}}$ mode and run the tape. (See Fig. 8-1-4)
2) In tape running state, confirm whether the arrow marked Ⓐ point is positioned at the point (arrow mark Ⓑ) 1/3 within the thickness of LS guide ❷ or not. (See Fig. 8-42)
3) When it is not at the specified position, remove the cassette and perform the adjustments described in after step 4).
4) Loosen screw ❸.
5) If TG-1 arm assembly ❶ is within the inner side than the specified position, shift the tension regulating band plate ❹ slightly in the direction of arrow Ⓒ. If it is in the outer side, shift it slightly in the direction of arrow Ⓓ and secure it with screw ❸. (See Fig. 8-43)

Notes:

1) Use a cassette tape which has been forwarded to about the middle section.
2) Perform steps 4) and 5) after extracting cassette tape.

3. Installation

By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.

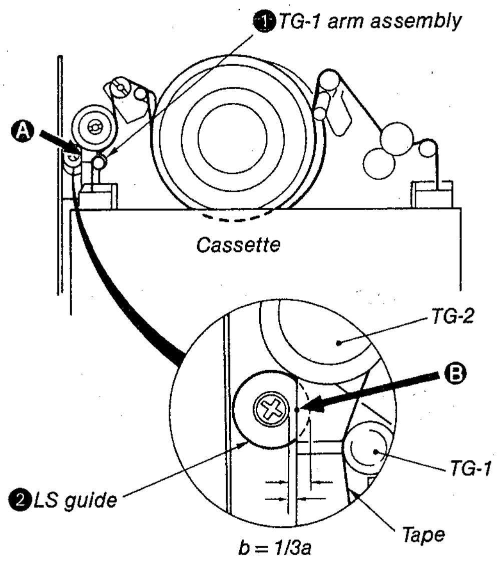


Fig. 8-42.

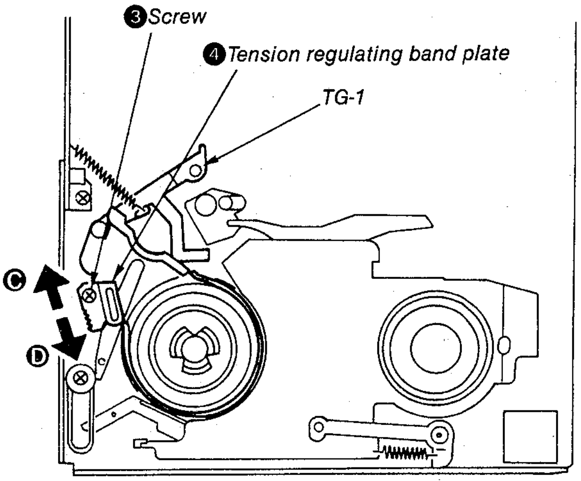


Fig. 8-43.

8-3-29. FWD Back Tension Adjustment

1. Removal

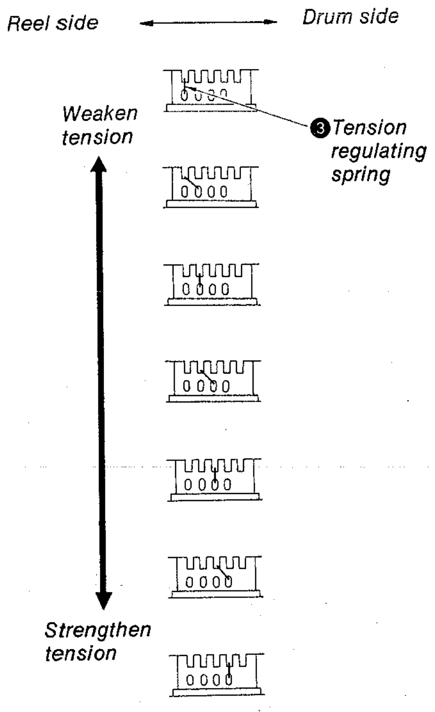
By referring to 8-1-1 and 8-1-2, remove cassette arm assembly.

2. Adjustment

1) Turn into REC mode.
2) Set the tension measuring exclusive reel (Ref. No. J-7) ❶.
3) Measure tape tension of the outgoing side by using dial tension gauge (Ref. No. J-6) ❷. At this point, the measurement should be conducted by pulling the tape at the speed of 14mm/sec. (See Fig. 8-44)
4) Move spring hooking position ❹ of tension regulating spring ❸ so that the tension applied becomes within the range of 6.9 to 7.9g. (See Fig. 8-45)

3. Installation

1) By referring to 8-1-1 and 8-1-2, install cassette arm assembly and LS cassette compartment assembly.


Reel side
Drum side
Weaken tension
❸Tension regulating spring
Strengthen tension

Note: Do not hook the spring at a closer position to the drum side than this position

Fig. 8-44.

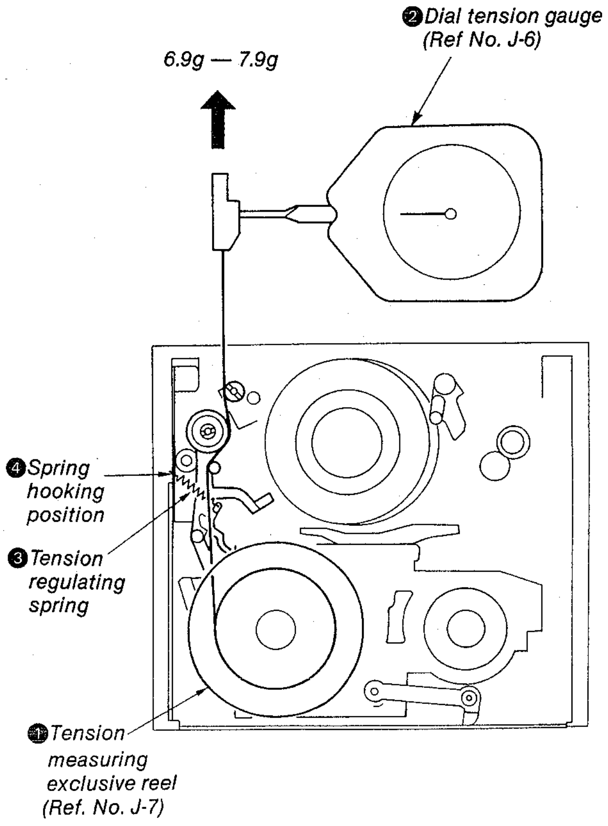

❷Dial tension gauge (Ref No. J-6)
6.9g — 7.9g
❹Spring hooking position
❸Tension regulating spring
❶Tension measuring exclusive reel (Ref. No. J-7)

Fig. 8-45.

8-4-1. TRACK SHIFT AND MONITOR JIG CONNECTING PROCEDURE

1) Supply power to Power Supply Connector (PS IN) as follows:

SYSTEM CONN: Connect the AC-V8E/UB on that has been modified by paragraph 4) Modifying Procedure.

AC ADP: Connect an AC adapter AC-M110/AC-M110E/ for Beta movie.

REG: Connect a commercially available 12V 3A regulated DC power supply on.

Connect Blue Clip to its (+) positive end and Black Clip to its (−) negative end (GND), and operate it at about 8V. (Extention code: JIG No. J-18)

Note:

Priorities have been assigned to the three above connectors, where SYSTEM CONN carries the highest priority and REG the lowest.

Accordingly, even where they have been connected on together, power will be supplied to SYSTEM CONN.

2) Connection of the connector (See Fig. 8-50)

RF/SWP ....The connector which picks up the RF signals of the RF SW PULSE and CH1 and CH2 of the drum head, and it connects the RF/SWP and CN105 on the MR-8 board. (Ref No. J-17)

CTL ....The connector to supply the SEL and ATF LOCK signals and it connects the CTL and CN502 on the SS-70 board. (Ref No. J-17)

Other connectors than the above are not used in this set.

3) Setting of the individual switches

SEL ....Turn the SEL "ON" when performing track shift. When it is turned "OFF", it becomes the control on the set side being connected.

PATTERN...Set to the EV side.

ATF LOCK ..

Turn it "OFF".

Other switches than the above are not used in this set.

4) AC-V8UC (AC Adapter for CCD-V8) Modifying Procedure

i) Remove two screws ❶ and two screws ❷, and dismount Upper Housing (See Fig. 8-51)

ii) Short pins ⑱ and ㉑ of IC5 on SB-F Board by soldering lead wire, etc. (See Fig. 8-52)

iii) Mount Upper Housing back on, and tighten two screws ❶ and two screws ❷ (See Fig. 8-51).

Notes:

- When connecting AC-V8E/UB to Track Shift and Monitor Jig, be sure to modify it by the above steps in advance.
- When power is supplied with a modified AC-V8E/UB, a little pushing the AC-V8E/UB switch off.

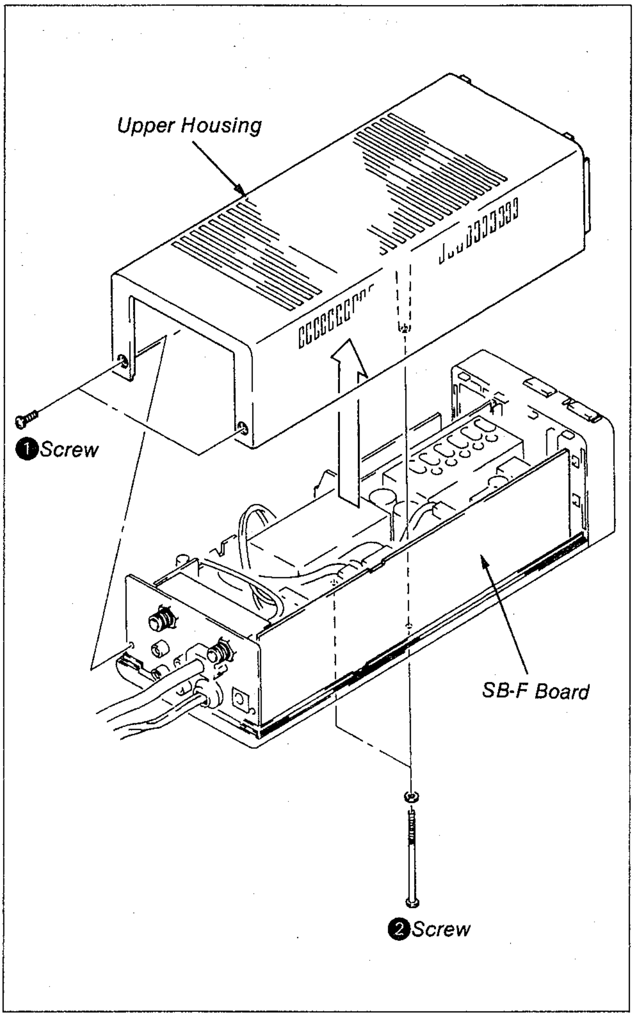


Fig. 8-51.

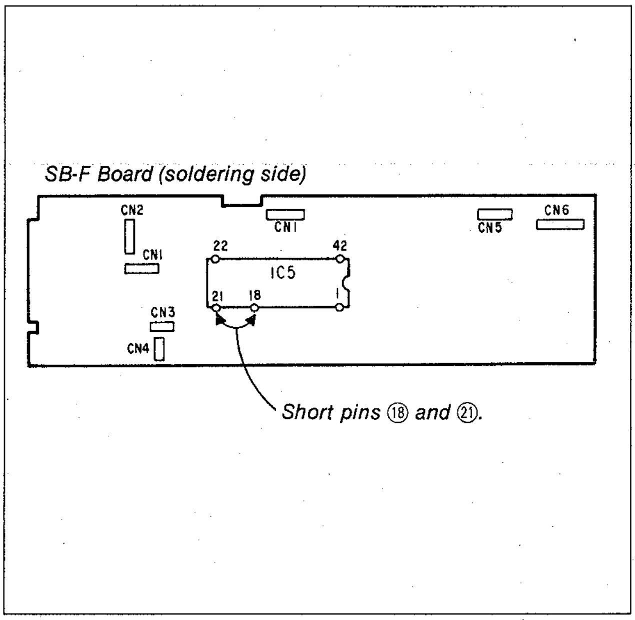


Fig. 8-52.

8-4-2. Preparation for Adjustment

1) Clean the tape running surfaces (tape guide, drum, capstan shaft, pinch roller).
2) Referring to 8-4-1 Connection Diagram of Track Shift & Monitor Jig, connect the track shift & monitor jig and set the jig switch.
3) Connect the oscilloscope.
   1CH: CN2 terminal of the track shift & monitor jig (output of the CH2 head)
   2CH: RF SWP terminal of the track shift & monitor jig (external trigger)
4) Playback the tracking alignment tape (WR5-1N)
5) Turn the track shift knob of the track shift & monitor jig to maximize the amplitude of a RF waveform. (Refer to Fig. 8-53.) When the RF waveform is unstable and difficult to adjust, made adjustment after turning on the ATF LOCK switch. Then, return it to "OFF" after adjustment.

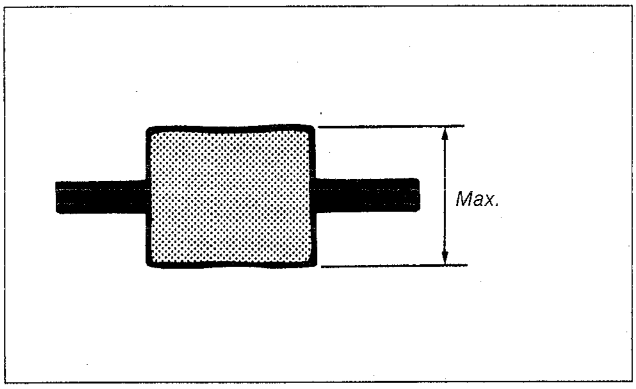


Fig. 8-53.

6) Confirm that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. (Refer to Fig. 8-54 ⓐ.) When it is not flat, adjust as follows:
   - When the RF waveform at the inlet/outlet side is not flat; (Refer to Fig. 8-54 ⓑ or ⓒ.)
     After making tracking coarse adjustment in 8-4-3, make tracking fine adjustment in 8-4-4.

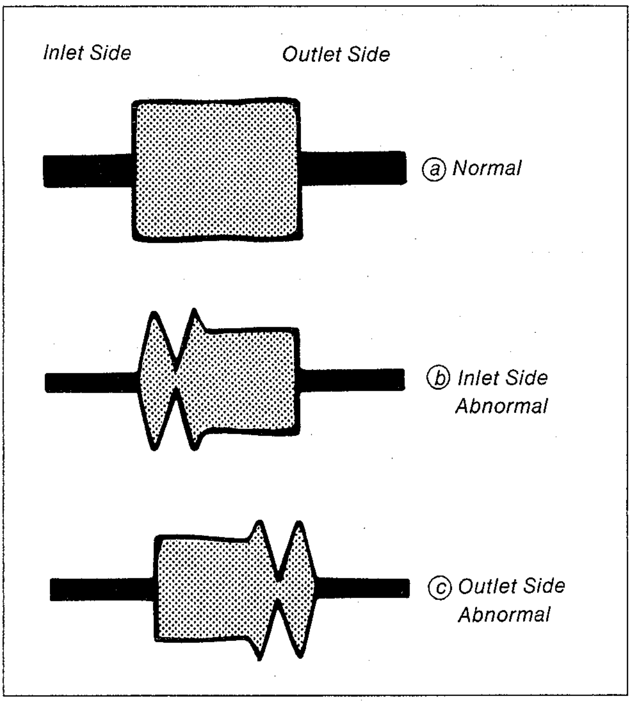

Inlet Side
Outlet Side
ⓐ Normal
ⓑ Inlet Side Abnormal
ⓒ Outlet Side Abnormal

Fig. 8-54.

7) When the RF waveform is normal, proceed to 8-4-8 checks after Adjustment.

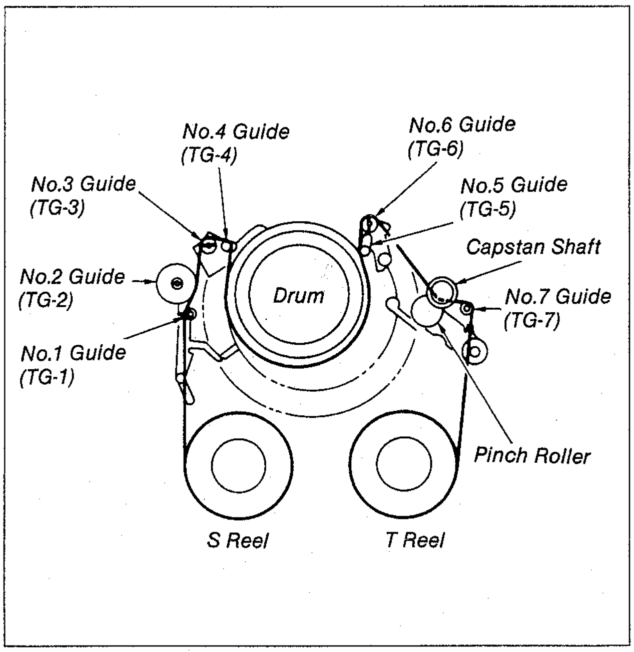

No.4 Guide (TG-4)
No.6 Guide (TG-6)
No.3 Guide (TG-3)
No.5 Guide (TG-5)
Capstan Shaft
No.2 Guide (TG-2)
Drum
No.7 Guide (TG-7)
No.1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 8-55.

8-4-3. Tracking Coarse Adjustment

1) Playback the tracking alignment tape.
2) Turn the track shift knob of the track shift & monitor jig to maximize the amplitude of the RF waveform. (Refer to Fig. 8-53.)
3) Loosen the lock screw ❶ of the No. 3 guide (TG-3) and turn the No.3 guide to make flat the waveform at the inlet side. (Refer to Fig. 8-56.)
4) Loosen the lock screw ❷ of the No.6 guide (TG-6) and turn the No.6 guide to make flat the waveform at the outlet side. (Refer to Fig. 8-57.)

   Note:

   Be careful not to loosen the lock screw too much because the guide will be easily moved.

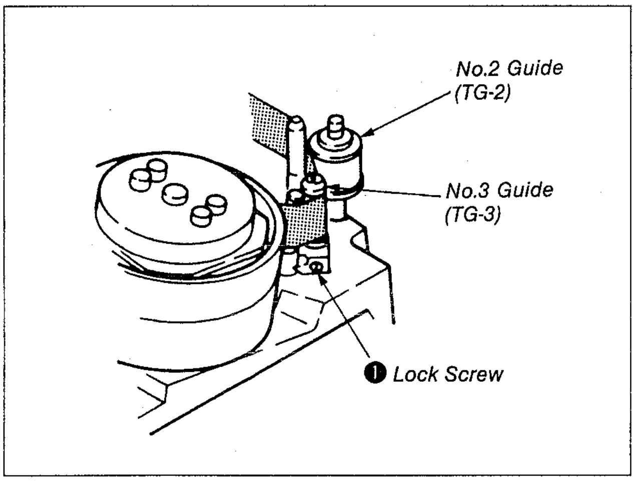


Fig. 8-56.

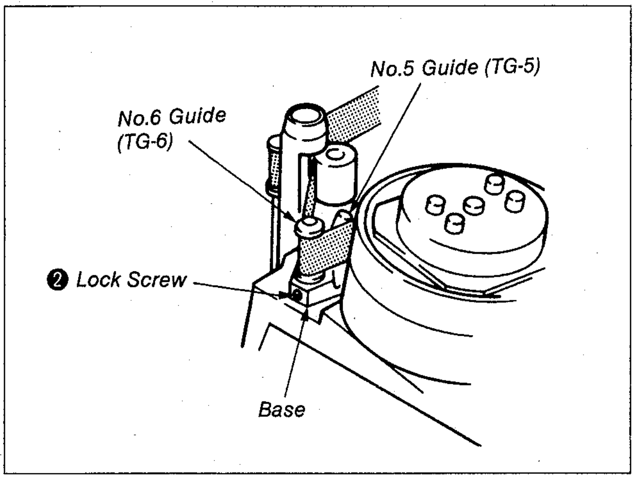


Fig. 8-57.

8-4-4. Tracking Fine Adjustment

1) Playback the tracking alignment tape, and turn the track shift knob of the track shift & monitor jig in the counter clockwise direction to adjust the amplitude of the RF waveform to two-thirds of its maximum. (Refer to Fig. 8-57.)

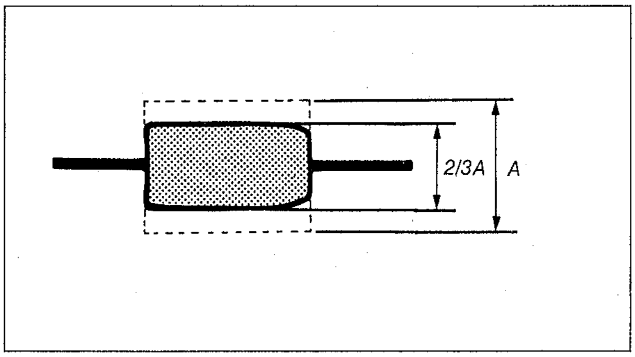


Fig. 8-58.

2) Confirm whether or not the waveform is flat. When it is not flat, turn the No.3 and No.6 guides (TG-3 and TG-6) to make it flat. (Refer to Fig. 8-56, 8-57)
3) Tighten the lock screw of the No.3 guide to lock it. When this is done, confirm that the waveform at the inlet side does not change.
4) Tighten the lock screw of the No.6 guide to lock it. When this is done, confirm that the waveform at the outlet side does not change.

   Note:

   When tightening the lock screw of the No.6 guide, turn the lock screw with the base gently held down lest the tip of the No.5 guide (TG-5) should touch the drum. (Refer to Fig. 8-57.)

8-4-5. No.2 Guide (TG-2) Adjustment

When the No.2 guide is turned or replaced, adjust it after presetting a height.

- No.2 guide height presetting

1) Screw in until the slit of the TG-2 nut comes as high as the top of the TG-2 shaft. (Fig. 8-59 ⓐ)

   Note:

   Preset the height after completely removing screw lock.

2) Turn the TG-2 nut 1/2 times in the clockwise direction. (Fig. 8-59 ⓑ)

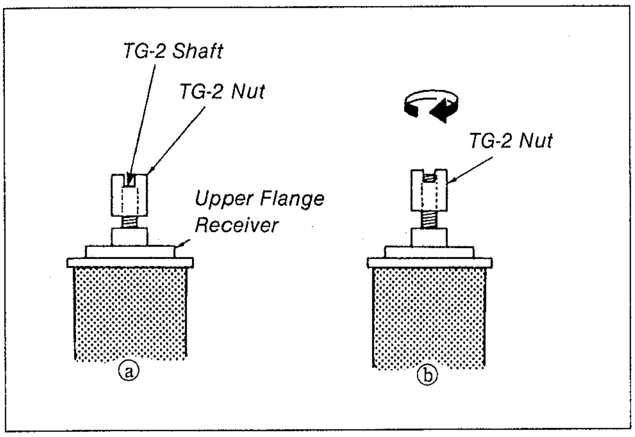


Fig. 8-59.

- No.2 guide (TG-2) adjustment

1) Playback the tracking alignment tape.
2) Turn off the SEL switch of the track shift & monitor jig.
3) Confirm the waveform in the REV mode. (Refer to Fig. 8-60.)

   Note:

   Make confirmation at the beginning of the alignment tape.

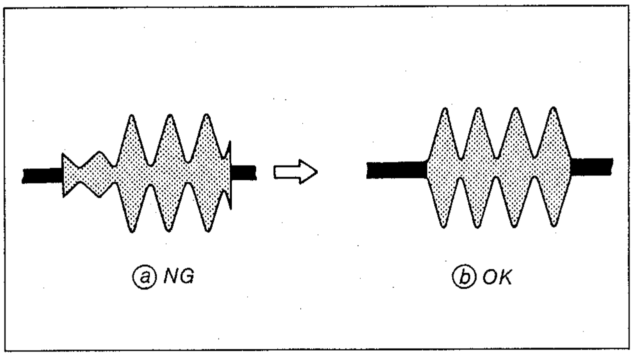


Fig. 8-60.

- When a normal waveform is not obtained (Fig. 8-60 ⓐ); Preset the No.2 guide height and go through the following adjustment:

4) Turn the TG-2 nut by 90° in the clockwise direction and take the step 3) again. Repeat the steps 3) and 4).

   At this time, confirm that the tracking waveform (Fig. 8-58) has not changed. If changed, make tracking fine adjustment at the inlet side and take the step 3) again.

5) Tighten the lock screw of the No.3 guide (TG-3). When this is done, confirm that the waveform at the inlet side does not change.
6) Apply screw lock to the No.2 guide (TG-2).

8-4-6. No.7 Guide (TG-7) Adjustment

1) Playback the tracking alignment tape and select the REV mode.
2) Confirm that there is no tape deflection between the No.6 guide (TG-6) and capstan. (Refer to Fig. 8-61.) When the tape has a deflection, adjust to remove the deflection by turning the No.7 guide (TG-7).
3) Once again in the PLAYBACK mode, confirm that there is no tape deflection between the No.7 guide (TG-7) and capstan. (allowable tape deflection = less than 0.5mm)

   When the tape has a deflection, adjust to remove the deflection by turning the No.7 guide (TG-7).

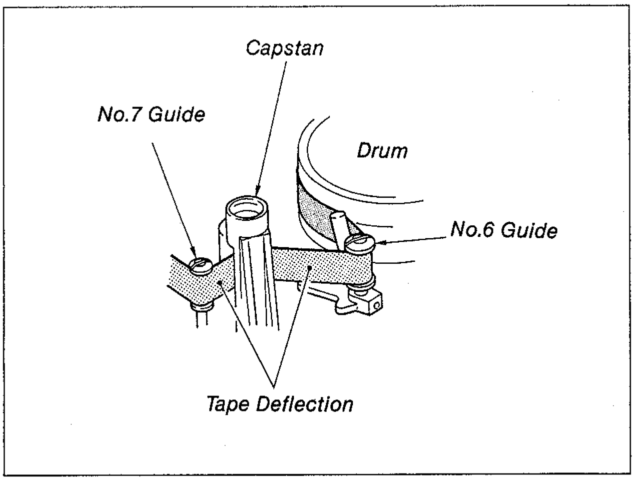


Fig. 8-61.

8-4-7. CUE and REV Waveform Confirmation

1) Playback the tracking alignment tape and select the REV mode. At this time, waveform peak pitches should be uniform. (Refer to Fig. 8-62 ⓐ.)
   When they are not uniform, make tracking fine adjustment (8-4-4) and No.2 guide adjustment (8-4-5).
2) Select the CUE mode. At this time, waveform peak pitches should be uniform. (Refer to Fig. 8-62 ⓑ.) When they are not uniform, make tracking fine adjustment (8-4-4).

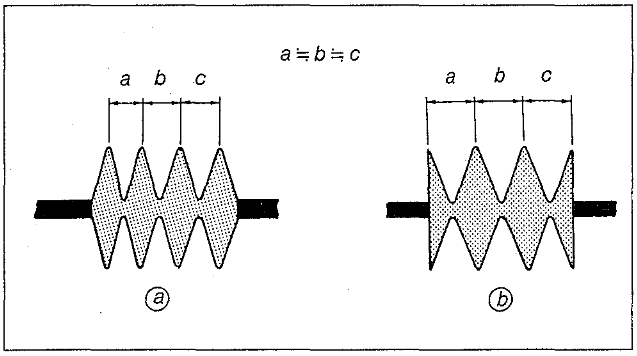


Fig. 8-62.

8-4-8 Checks after Adjustment

1. Tracking Check

1) Playback the tracking alignment tape. Turn the track shift knob of the track shift & monitor jig to adjust the amplitude of the RF waveform to two-thirds of its maximum. (Refer to Fig. 8-63.)
2) When this is done, confirm that an amplitude's minimum value (EMIN) is more than 75% of its maximum value (EMAX). (Refer to Fig. 8-64.)
3) Confirm that the waveform does not fluctuate greatly. (Refer to Fig. 8-65.)

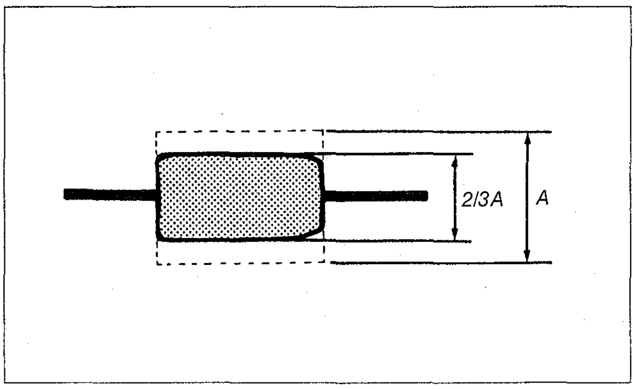
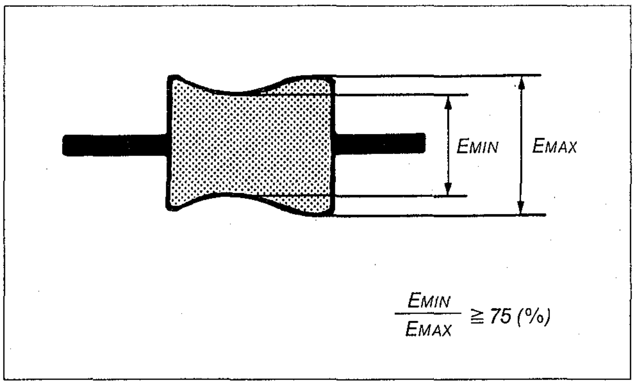
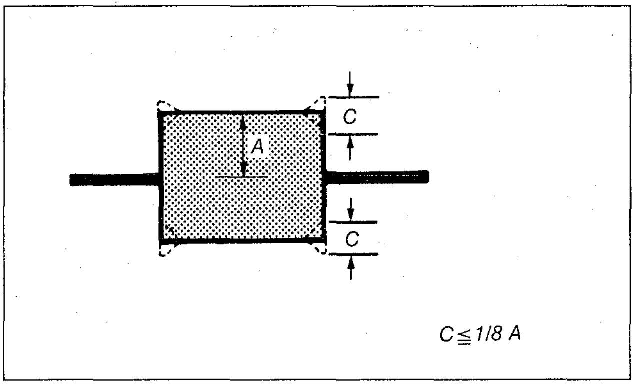


Fig. 8-63.



$$\frac{E_{MIN}}{E_{MAX}} \geqq 75\ (\%)$$

Fig. 8-64.



$C \leqq 1/8\ A$

Fig. 8-65.

2. Rise Check

1) Playback the tracking alignment tape.
2) Turn the track shift knob of the track shift & monitor jig to maximize the amplitude of the RF waveform.
3) Eject the tape once, and then, load it again.
4) In the PLAYBACK mode, confirm that the RF waveform horizontally rises within 1 second. Confirm also at this time that there is no tape deflection around the pinch roller. (Refer to Fig. 8-66.)
5) Playback after CUE/REV and FF/REW, and confirm that the RF waveform horizontally rises within 1 second. Confirm also at this time that there is no tape deflection around the pinch roller.
6) Repeat the steps 3) through 5).

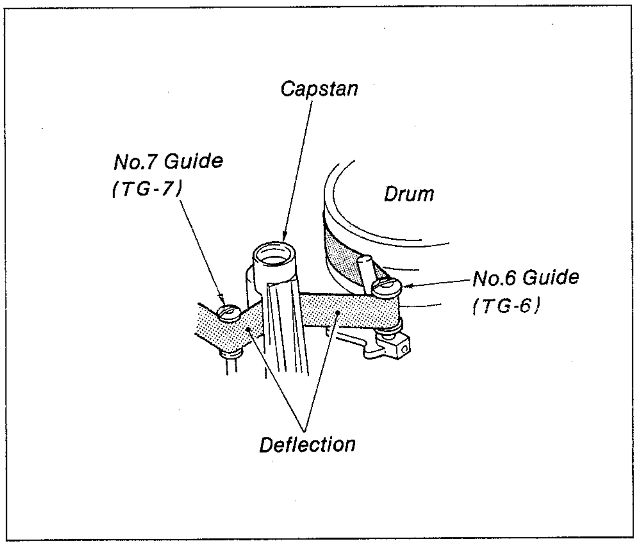

Capstan
No.7 Guide
(TG-7)
Drum
No.6 Guide
(TG-6)
Deflection

Fig. 8-66.

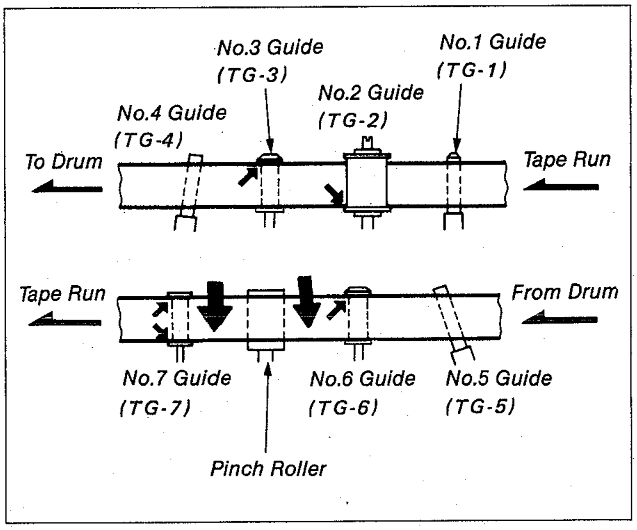

No.3 Guide
(TG-3)
No.1 Guide
(TG-1)
No.2 Guide
(TG-2)
No.4 Guide
(TG-4)
To Drum
Tape Run
Tape Run
From Drum
No.7 Guide
(TG-7)
No.6 Guide
(TG-6)
No.5 Guide
(TG-5)
Pinch Roller

Fig. 8-67.

3. Tape Run Check

Select the PLAYBACK mode, and confirm that the No.2 guide lower flange, No.3 guide upper flange and No.6 guide upper flange have no clearance or large curl, and that the No.7 guide upper and lower flanges have no curl. (Refer to Fig. 8-67.)

SECTION 9
ELECTRICAL ADJUSTMENT (VIDEO)

During the adjustment see the parts location diagram relevant the adjustment on page 304.

The following measuring instruments are needed in adjusting the VTR section:

[Equipment Required]

1) Monitor TV
2) AC pack
3) Oscilloscope Dual-trace, Bandwidth more than 10MHz with delay mode (Use a probe of 10:1, unless otherwise specified.)
4) Frequency Counter
5) Pattern generator with video output terminal
6) Digital voltmeter
7) Audio generator
8) Audio level meter
9) Audio distortion meter
10) Audio attenuator
11) Regulated DC power supply unit
12) Alignment Tape
    Tracking adjustment (WR5-1N)
        Part code: 8-967-995-01
    Video frequency response adjustment (WR5-2N)
        Part code: 8-967-995-11
    Operation check (WR5-3NL)
        Part code: 8-967-995-31
    Operation checking (WR5-3NSP)
        Part code: 8-967-995-22

[Precautions for Adjustment]

The video section can be also adjusted with the camera section and EVF removed, excluding "Battery Failure Adjustment" in System Control Adjustment and "EVF display position adjustment" in Video System Adjustment. When removing the camera section and EVF section, disconnect the following 5 connectors:

1. MV-11 board: CN203 (black)
2. MV-11 board: CN206
3. MV-11 board: CN207 (EVF 8-pin socket)
4. MV-11 board: CN208
5. SS-70 board: CN305 (white)
6. SS-70 board: CN307 (white)

When the audio input section (MA-21 and MJ-12 boards) is unnecessary, remove the following connector:

- SS-70 board: CN307 (white)

[Equipment Connection]

Unless otherwise specified, adjustment is made by connecting the measuring instruments as shown in the figure below.

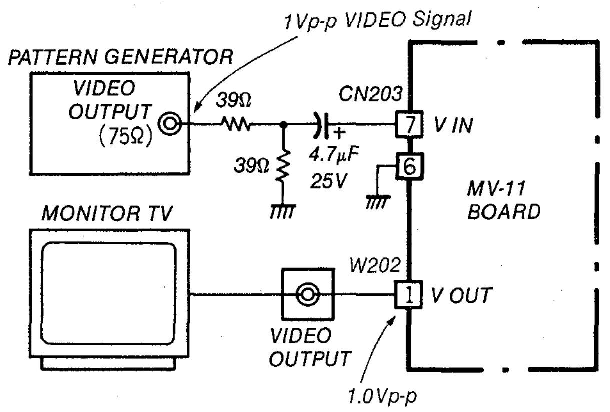


Fig. 9-1.

[Set-up during adjustment]

Since the video output signal obtained from the pattern generator is used as the adjusting signal of the VTR block adjustment, it is necessary that this video output signal has to be within the specification. Connect an oscilloscope to Pin ㊹ (VIDEO IN) of VY-8 Board on the MV-11 board and make sure that the amplitude of the video SYNC signal is approximately 0.15V, that the video block is approximately 0.35V, that the burst signal is 0.15V with flat characteristics, and the signal level ratio between the burst signal and "Red" signal is 0.30: 0.66. Fig. 9-2 shows video signals (color bars) used in adjusting the video section.

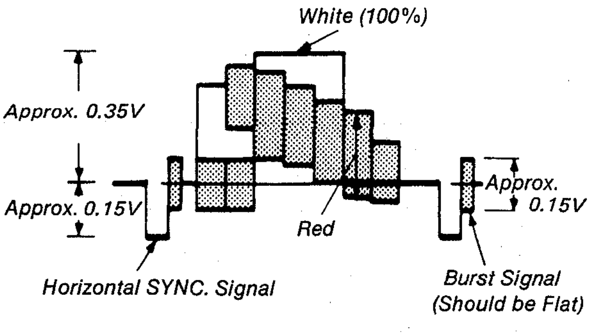
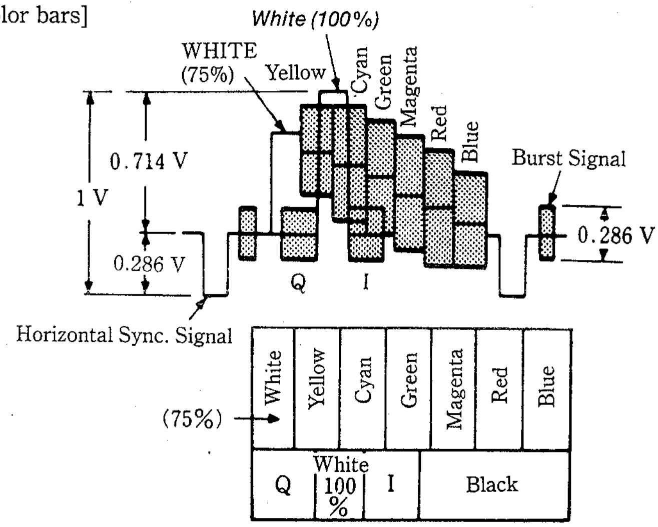


Fig. 9-2. Color bar signal of pattern generator

[Alignment Tape]

Tape	Content	Use
Tracking (WR5-1N)	1. Recording area PCM — Video 2. Recording content: CH2: 1MHz linearity adjustment signal (CH1: 9MHz)	Drum linearity adjustment
Video frequency characteristic (WR5-2N)	1. Recording area Video 2. Recording content RF sweep 0 to 10MHz 3. Marker 1, 3.58, 5.5 and 7MHz	Frequency characteristic adjustment
Operation checking SP mode (WR5-3NSP) LP mode (WR5-3NL) Note: PCM area is not included in WR5-3NL.	1. Recording area Video 2. Recording content ■ Video track ● Video signals Color bar: 10 sec. } Iterative Monoscope: 8 sec. } Iterative [Color bars]  White (100%) WHITE (75%) Yellow Cyan Green Magenta Red Blue Burst Signal 0.714 V 1 V 0.286 V 0.286 V Q I Horizontal Sync. Signal (75%) White Yellow Cyan Green Magenta Red Blue Q White 100 % I Black ● Audio signal (AFM) 400Hz, 60% modulation ■ PCM track (WR5-3NSP only) ● Audio signal (PCM) ● 1kHz, ... 10 sec. 20Hz, ... 2 sec. 400Hz, ... 4 sec. 14kHz, ... 2 sec. } Iterative	Operation checking

[Input/output levels and impedance]

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, −10dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5V DC, for the RFU-88UC only
MIC jack	Minijack, −66 dBs, low impedance With 2.5-3V DC output, impedance 6.8 kilohms
Microphone power output jack	Special Minijack, 5 V DC

9-1. POWER SUPPLY ADJUSTMENT

Note:

Adjust the power supply with the following connections given.

[Connection]

1) Remove AC pack or battery from battery grip.
2) Connect regulated DC power supply + side to Pin ③ of CN205 on the MV-11 board (DD UNREG) and − side to Pins ① and ② of CN205 (UNREG GND) and supply 6.3±0.1Vdc.
3) Connect Pin ㉞ of CN201 on the MV-11 board ($\overline{\text{VTR DD ON}}$) and GND with jumper wire.

9-1-1. DC/DC Converter Frequency Adjustment (MV-11 Board)

Measurement point	Q653 collector
Measurement equipment	Frequency counter
Adjustment element	RV651
Specified value	475±5kHz

[Adjustment Method]

1) Adjust the frequency to 475±5kHz with RV651.

9-1-2. DC/DC Converter Output Voltage Adjustment (MV-11 Board)

Measurement point	Pin ㉖ of the VC-10 board
Measurement equipment	Digital voltmeter
Adjustment element	RV652
Specified value	5.10±0.05Vdc

[Adjustment Method]

1) Adjust the voltage to 5.10±0.05Vdc with RV652.

9-2. SYSTEM CONTROL ADJUSTMENT

9-2-1 Battery Failure Adjustment (MR-8 Board)

Note:

Remove the electronic view finder and turn the focus switch to manual position.

Mode	RECORD
Subject	Arbitrary
Measurement point	CN505 pin ① ($\overline{\text{BATT DOWN}}$) (SS-70 board)
Measurement equipment	Oscilloscope (DC range)
Adjustment element	RV156
Specified value	5.79±0.01Vdc

[Connection]

1) Remove the AC PACK or BATTERY from the battery grip.
2) Connect the regulated DC power supply as shown in Fig. 9-3.
3) Connect check land CL351 (Pin ⑦ of CN304) on the SK-19 board and CL352 (Pin ① of CN304) with diode (1SS119 or equivalent) and set to test mode. Refer to Fig. 9-4.

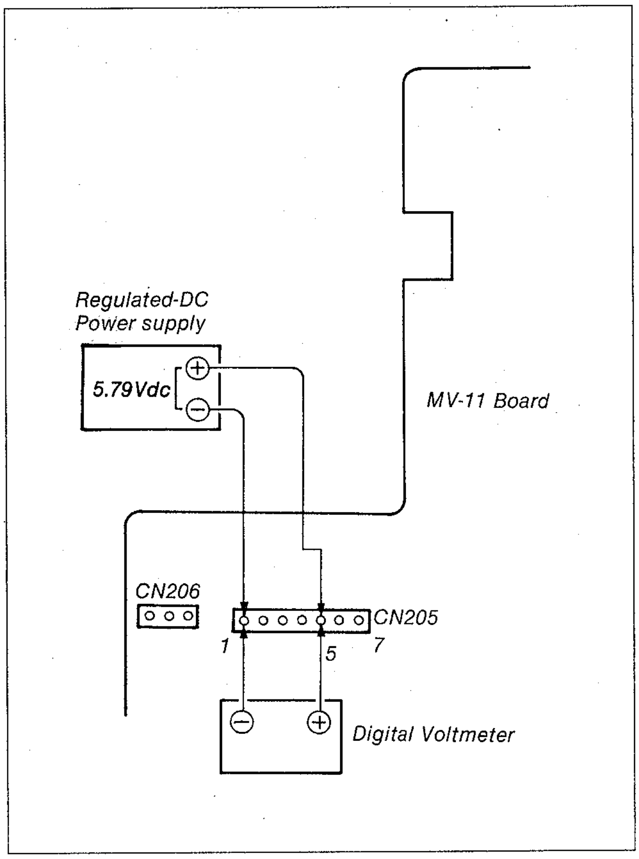


Fig. 9-3.

Note:

Install camera section and electronic view finder and perform adjustment and checking by making focus switch to "manual".

[Adjustment Method]

1) Adjust the output voltage of the regulated DC power supply unit so that the digital voltmeter will indicate 5.79±0.01 Vdc. (VTR in a recording state)
2) Rotate RV156 slowly and set to the point where the DC level of the CN505 pin ① of the SS-70 board is about to change from "H" to "L".

[Checking Method]

Check as follows, and make readjustment when its result is not satisfactory:

Note:

Mount the electronic view finder and turn the focus switch to manual position.

1) Remove the diode connected between CL351 and CL352 and release the test mode.
2) Adjust the output voltage of the regulated DC power supply unit so that the digital voltmeter will indicate 6.03±0.01 Vdc. (VTR in a recording state)
3) Check that characters "BATTERY" within the EVF are not lit up, and that the TALLY lamp is not blinking.
4) Lower the output voltage of the regulated DC power supply unit so that the digital voltmeter will indicate 5.75±0.01 Vdc.
5) Check that the characters "BATTERY" within the EVF and the TALLY lamp are blinking every other second.

9-3. SERVO SYSTEM ADJUSTMENT

9-3-1. Drum Free Speed Adjustment (MR-8 Board)

Mode	PLAYBACK
Signal	Any tape
Measurement point	CN505 pin ⑤ (ADE) (SS-70 board)
Measurement equipment	Digital voltmeter
Adjustment element	RV155
Specified value	2.1±0.1Vdc

[Adjustment Method]

1) Adjust to 2.1±0.1Vdc with RV155.

9-3-2. Capstan Free Speed Adjustment (MR-8 Board)

Mode	PLAYBACK
Signal	Any tape
Measurement point	CN505 pin ② (C FG) (SS-70 board)
Measurement equipment	Frequency counter
Adjustment element	SP mode: RV151 LP mode: RV152
Specified value	SP mode: 825±2Hz LP mode: 412.5±1.5Hz

[Connection]

1) Connect TP105 on the MR-8 board and GND with a 220μF/16V electrolytic capacitor. (GND to the negative pole side of the capacitor)
2) Connect the CL351 and CL352 of the SK-19 board with a diode (1SS119 or equivalent) for set up TEST mode as shown in Fig. 9-4.

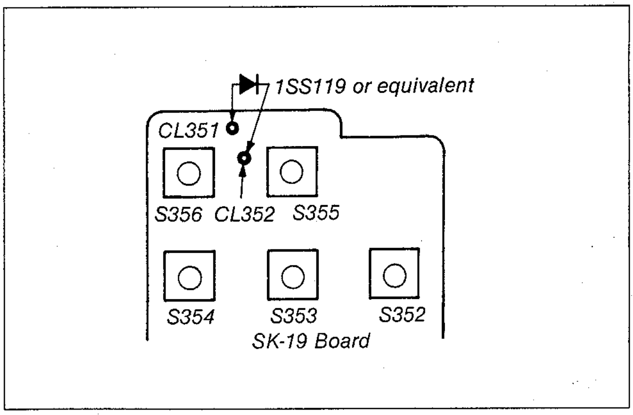

1SS119 or equivalent
CL351
S356
CL352
S355
S354
S353
S352
SK-19 Board

Fig. 9-4.

[Adjustment Method]

Adjustment for the LP mode is given in brackets [ ].

1) Set the EDIT switch (S201 on the MV-12 board) to OFF/SP [ON/LP] position.
2) In the PLAYBACK mode, adjust to 825±2Hz [412.5 ±1.5Hz] with RV151 [RV152].

   Note:

   Be sure to adjust SP mode in advance.

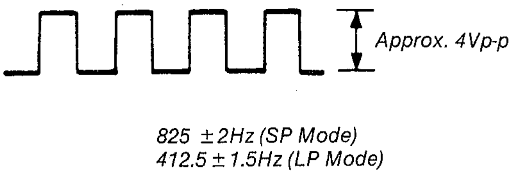

Approx. 4Vp-p
825 ±2Hz (SP Mode)
412.5±1.5Hz (LP Mode)

Fig. 9-5.

9-3-3. Switching Position Adjustment (MR-8 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP)
Measurement point	CH1: Video output terminal CH2: MR-8 board CN105 pin ② (RF SWP)
Measurement equipment	Oscilloscope
Adjustment element	RV153
Specified value	6.5±0.3H (410±20μsec)

[Adjustment Method]

1) Adjust to 6.5±0.3H (410±20μsec) with RV153.

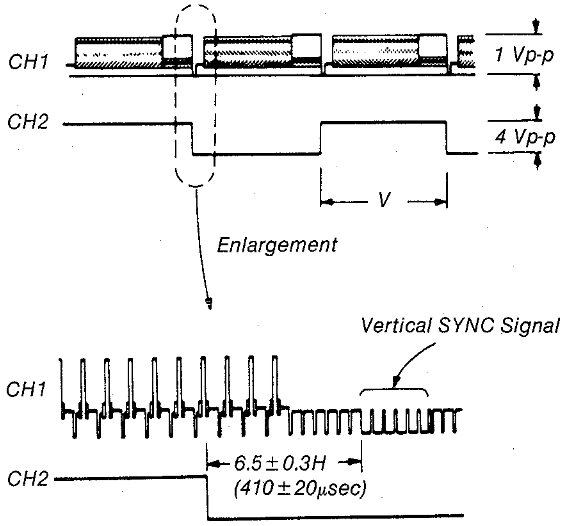

CH1
1 Vp-p
CH2
4 Vp-p
V
Enlargement
Vertical SYNC Signal
CH1
CH2
6.5±0.3H
(410±20μsec)

Fig. 9-6.

9-3-4. ATF BPF Balance Adjustment (SS-70 Board)

Mode	PLAYBACK (Self recorded tape by SP mode)
Signal	Any signal
Measurement point	Pin ⑪ and ⑫ of IC507 (FL501, FL502)
Measurement equipment	Oscilloscope
Adjustment element	RV502
Specified value	A 16kHz signal level (IC507 pin ⑪) should be equal to a 47kHz signal level (IC507 pin ⑫).

[Adjustment Method]

1) Playback the recorded tape by SP mode.
2) Connect the oscilloscope to the IC507 pin ⑫ and read a 47kHz signal level (approx. 2Vp-p).
3) Connect the oscilloscope to the IC507 pin ⑪.
4) Make the 16kHz signal level equal to the 47kHz signal level with RV502.

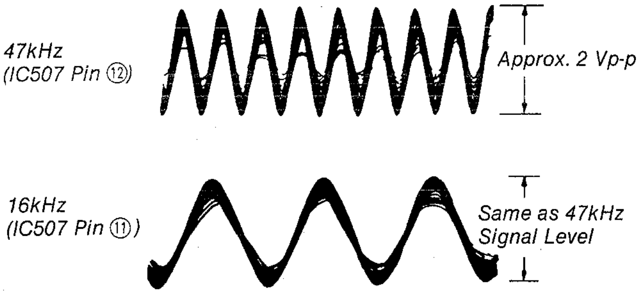


Fig. 9-8.

9-4. VIDEO SYSTEM ADJUSTMENT

In principle adjust the video system in the following procedure. Color video signals fed by a pattern generator are utilized as video input signals for video system adjustment in the RECORD mode. Check that the SYNC and color burst signals match the standard designated in Fig. 9-2.

[Adjustment Procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) X'tal oscillator f_0 adjustment
4) Y/C Separation adjustment
5) Y comb filter adjustment
6) SYNC AGC adjustment
7) VIDEO OUT level adjustment
8) PB Y level adjustment
9) Y FM carrier frequency adjustment
10) Y FM deviation adjustment
11) White clip adjustment
12) $378f_H$ VCO adjustment
13) Chroma emphasis f_0 adjustment
14) Carrier balance adjustment
15) REC Y recording current adjustment
16) REC C recording current adjustment
17) REC AFM recording current adjustment
18) REC ATF recording current adjustment
19) EVF Internal display position adjustment

9-4-1. Playback Frequency Characteristic Adjustment (RP-34/MR-8 Boards)

CH2 adjustment is shown in brackets [ ].

Mode	PLAYBACK
Signal	Alignment tape: Frequency characteristic adjustment (WR5-2N)
Measurement point	CN105 pin ④ [③] of MR-8 board External trigger: CN105 pin ② of MR-8 board Trigger slope: + [−]
Measurement equipment	Oscilloscope
Adjustment element	RV003 [RV004] of the RP-34 board
Specified value	3.58MHz level : 5.5MHz level = 4:3

[Adjustment Method]

1) Adjust a ratio between the 3.58MHz and 5.5MHz levels to 4 : 3 [4 : 3] with RV003 [RV004].

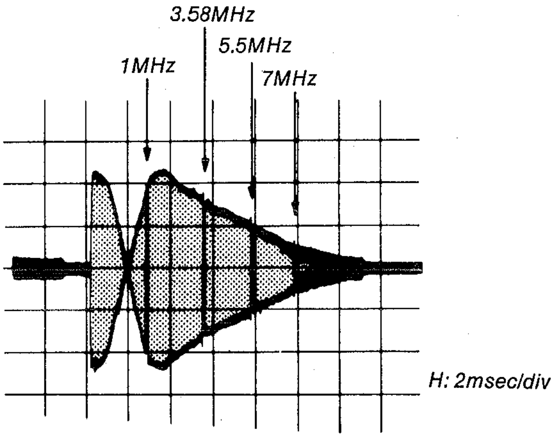


Fig. 9-9.

9-4-2. Flying Erase Check (MR-8 Board)

Mode	RECORD
Signal	Arbitrary
Measurement point	TP104 (FE(X))
Measurement equipment	Oscilloscope and frequency counter
Specified value	Frequency: More than 7.5MHz Voltage: More than 7.0Vp-p

[Checking Method]

1) Check that an oscillation frequency is more than 7.5MHz and an oscillation voltage is more than 7.0Vp-p.

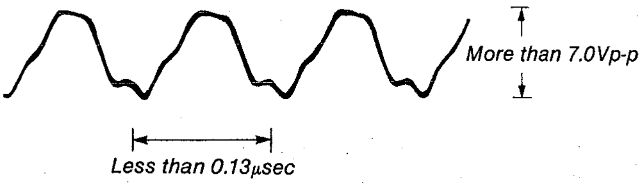


Fig. 9-10.

9-4-3. X'tal Oscillator fo Adjustment (VC-10/MV-11 Boards)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP)
Measurement point	Pin ⑩ of the VC-10 board
Measurement equipment	Frequency counter
Adjustment element	CV001 of the VC-10 board
Specified value	3579545 ± 50Hz

Note:

Connect the frequency counter through a buffer with high impedance (approx. 10MΩ) and low capacity (less than 10 pF).

[Adjustment Method]

1) Adjust to 3579545 ± 50Hz with CV001.

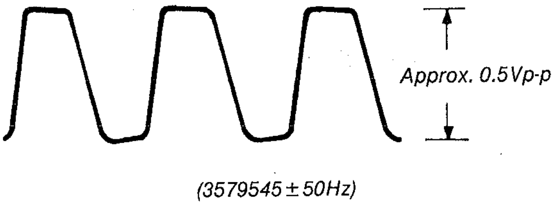


Fig. 9-11.

9-4-4. Y/C Separation Adjustment (VD-5/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	Pin ㉕ of the VD-5 board
Measurement equipment	Oscilloscope
Adjustment element	RV002 (VD-5 board) LV201 (MV-11 board)
Specified value	Minimum residual chroma component

[Adjustment Method]

1) Adjust RV002 of the VD-5 board and LV201 of the MV-11 board alternately to minimize residual chroma components.

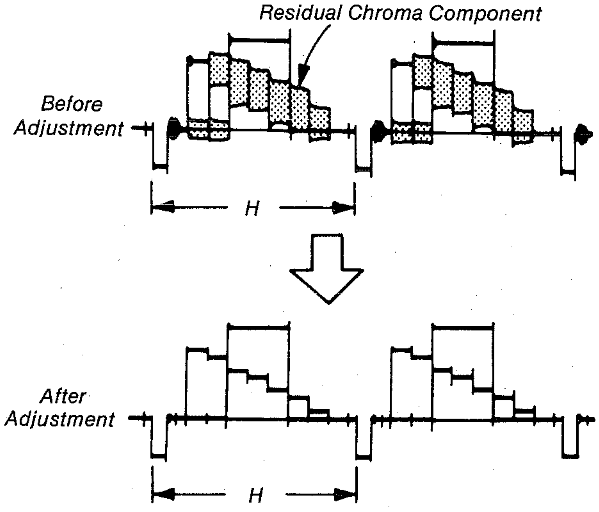


Fig. 9-12.

9-4-5. Y Comb Filter Adjustment (VD-5/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	TP207 of the MV-11 board (pin ⑫ of the VD-5 board)
Measurement equipment	Oscilloscope
Adjustment element	RV001 of the VD-5 board
Specified value	An amplitude between the white (75%) and pedestal should be 75±25mV.

Note:

Connect a 22kΩ resistor in series between TP207 and a probe of 10:1.

[Adjustment Method]

1) Adjust an amplitude between the white (75%) and pedestal to 75±25mV with RV001.

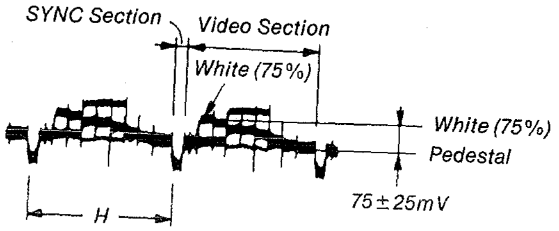


Fig. 9-13.

9-4-6. SYNC AGC Adjustment (VY-8/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	Pin ② of the VY-8 board
Measurement equipment	Oscilloscope
Adjustment element	RV002 of the VY-8 board
Specified value	0.50±0.01Vp-p

[Adjustment Method]

1) Adjust to 0.50±0.01Vp-p with RV002.

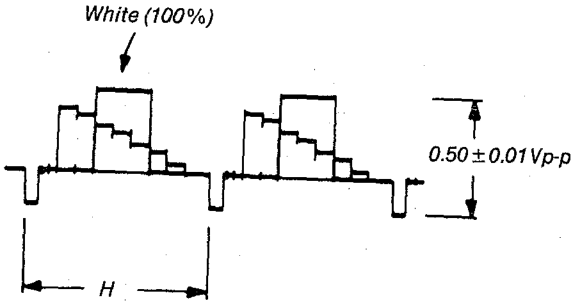


Fig. 9-14.

9-4-7. VIDEO OUT Level Adjustment (VY-8 /MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	CN204 pin ① (VIDEO OUT) of the MV-11 board
Measurement equipment	Oscilloscope
Adjustment element	RV001 of the VY-8 board
Specified value	1.00±0.05Vp-p

Note:

Terminate at 75Ω the VIDEO OUT terminal of the FP-49 board.

[Adjustment Method]

1) Adjust to 1.00±0.05Vp-p with RV001.

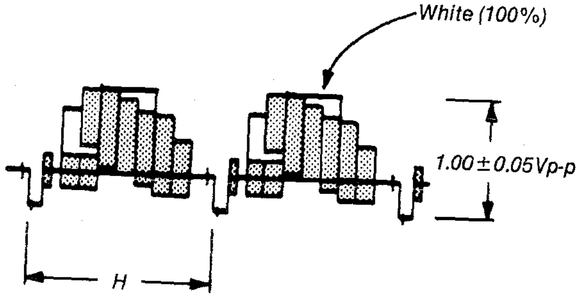


Fig. 9-15.

9-4-8. PB Y Level Adjustment (VY-8/MV-11 Boards)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), color bar portion
Measurement point	CN204 pin ① (VIDEO OUT) of the MV-11 board
Measurement equipment	Oscilloscope
Adjustment element	RV006 of the VY-8 board
Specified value	1.00±0.05Vp-p

Notes:

1) The EDIT switch (MV-11 board, SW201) should be turned off.
2) Terminate at 75Ω the VIDEO OUT terminal of the FP-49 board.

[Adjustment Method]

Adjust to 1.00±0.05 with RV006.

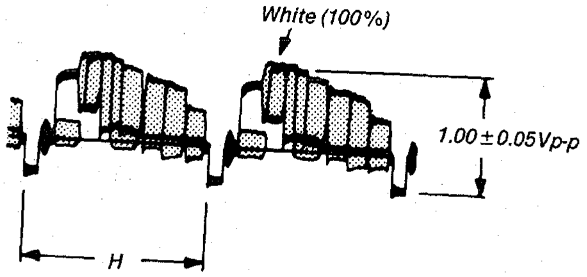


Fig. 9-16.

9-4-9. Y FM Carrier Frequency Adjustment (VY-8/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	None
Measurement point	Pin ㉖ (REC Y RF) of the VY-8 board
Measurement equipment	Frequency counter
Adjustment element	RV003 of the VY-8 board
Specified value	4.20 ± 0.05MHz

[Adjustment Method]

1) Set RV004 (AC CLIP) of the VY-8 board to the mechanical center (slide terminal for RV004 being approx. 2.7Vdc).
2) Adjust to 4.20 ± 0.05MHz with RV003.
3) Make "deviation adjustment" and "AC clip adjustment".

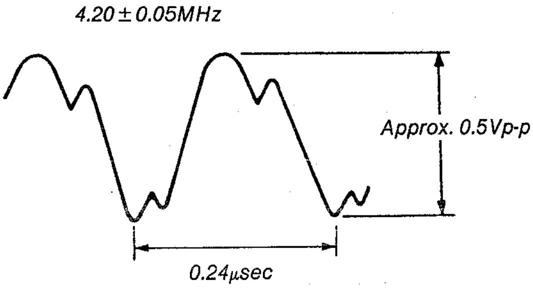


Fig. 9-17.

9-4-10. Y FM Deviation Adjustment (VY-8/MV-11 Boards)

Mode	RECORD and PLAYBACK
Signal	Color bar
Measurement point	Pin ① of CN204 (MV-11 board)
Measurement equipment	Oscilloscope
Adjustment element	RV005 of the VY-8 board
Specified value	Playback level at 1.00 ± 0.05Vp-p

Notes:

1) "VIDEO OUT level adjustment", "PB Y level adjustment" and "Y FM carrier frequency adjustment" should be already completed.
2) The EDIT switch (MV-11 board, SW201) should be turned off.
3) Terminate at 75Ω the VIDEO OUT terminal of the FP-49 board.

[Adjustment Method]

1) Record color bar signal.
2) Playback a recorded portion.
3) Confirm a playback output level.
   Standard: 1.00 ± 0.05Vp-p
4) When the standard is not met, repeat the above-mentioned steps 1) through 3) after turning RV005 as follows:

	RV005 Rotating Direction
Larger than specified value	Clockwise (↻)
Smaller than specified value	Counter-clockwise (↺)

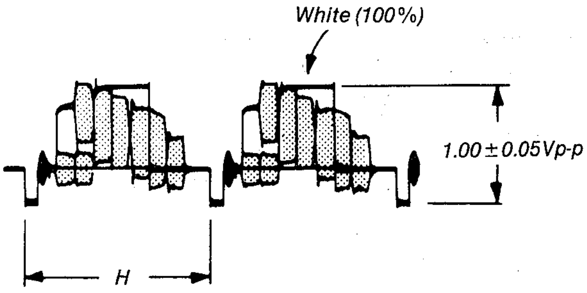


Fig. 9-18.

9-4-11. White Clip Adjustment (VY-8/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	Pin ㉜ of the VY-8 board
Measurement equipment	Oscilloscope
Adjustment element	RV004 of the VY-8 board
Specified value	240 ± 10%

[Adjustment Method]

1) Adjust the peak of white 100% to 240 ± 10% with RV004.

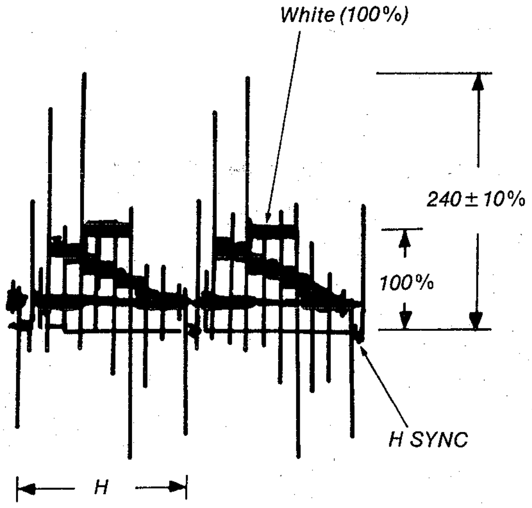


Fig. 9-19.

9-4-12. $378f_H$ VCO Adjustment (VC-10/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	Pin ㊼ of the VC-10 board
Measurement equipment	Digital voltmeter
Adjustment element	RV001
Specified value	3.0 ± 0.1Vdc

[Adjustment Method]

1) Adjust to 3.0 ± 0.1Vdc with RV001.

9-4-13. Chroma Emphasis f_0 Adjustment (VC-10/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	Pin ㊿ of the VC-10 board
Mesurement equipment	Oscilloscope
Adjustment element	T201 of the MV-11 board
Specified value	f_0 component at minimum

[Connection]

Connect the following two places of the VC-10 board with jumper wires.

1) Pin ㊽ (ACC) and pin ㉑ (GND)
2) Pin ㊽ (ACC) and pin ⑲ (REG 5V)

[Adjustment Method]

1) Minimize the amplitude of flat portions of chroma signals, using T201.

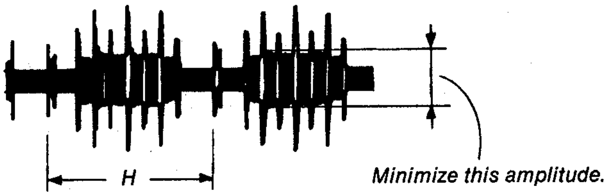


Fig. 9-20.

9-4-14. Carrier Balance Adjustment (VC-10/MV-11 Boards)

Mode	CAMERA STANDBY
Signal	Color bar
Measurement point	Pin ㊾ of the VC-10 board
Measurement equipment	Oscilloscope
Adjustment element	RV002
Specified value	4.32MHz component at minimum

[Adjustment Method]

1) Minimize 4.32MHz component with RV003.

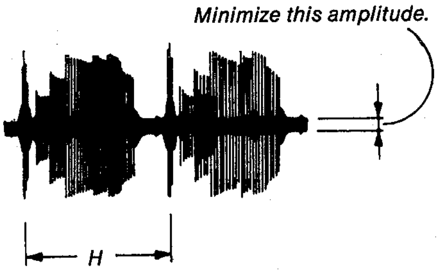


Fig. 9-21.

9-4-15. REC Y Recording Current Adjustment (RP-34/MR-8 Boards)

Mode	RECORD
Signal	None
Measurement point	TP101 (CH1 CHECK)
Measurement equipment	Oscilloscope
Adjustment element	RV001 of the RP-34 board
Specified value	210m Vp-p

Note:

After REC Y recording current adjustment, be sure to carry out each of REC C, REC AFM and REC ATF recording current adjustments.

[Adjustment Method]

1) Adjust to 210mVp-p with RV001.

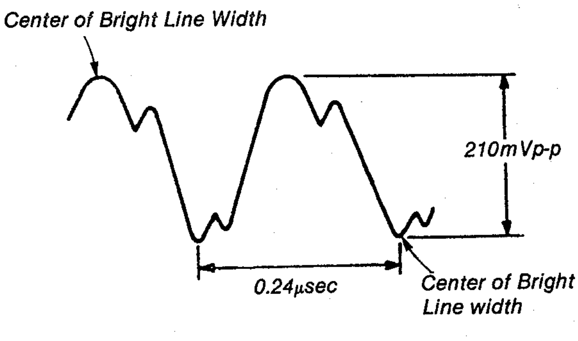


Fig. 9-22.

9-4-16. REC C Recording Current Adjustment (MV-11 Board)

Mode	RECORD
Signal	Color bar
Measurement point	TP101 (CH1 CHECK) of the RP-34 board)
Measurement equipment	Oscilloscope
Adjustment element	RV203
Specified value	40mVp-p

Note:

1) After REC C recording current adjustment, be sure to carry out each of REC AFM and REC ATF recording current adjustments.
2) Use MP type tape.

[Connection]

1) Connect the following two places with jumper wires:
   1. Pin ㉖ (REC Y RF) of the VY-8 board and GND
   2. CN201 pin ⑦ (PB ATF PILOT) and GND
2) Connect the following place of the AU-31 board with a jumper wire:
   1. Pin ㉙ (REC AFM) of the AU-31 board and GND

[Adjustment Method]

1) Adjust to 40mVp-p with RV203.

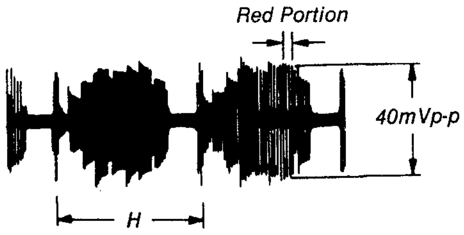


Fig. 9-23.

9-4-17. REC AFM Recording Current Adjustment (MV-11 Board)

Mode	RECORD
Signal	None
Measurement point	TP101 (CH1 CHECK) of the RP-34 board
Measurement equipment	Oscilloscope
Adjustment element	RV201
Specified value	9.0mVp-p

Notes:

1) Use MP type tape.
2) When a TP101 of the RP-34 board signal level is too low to read, connect directly through a 100Ω resistor as shown in the figure below instead of using a probe of 10:1.

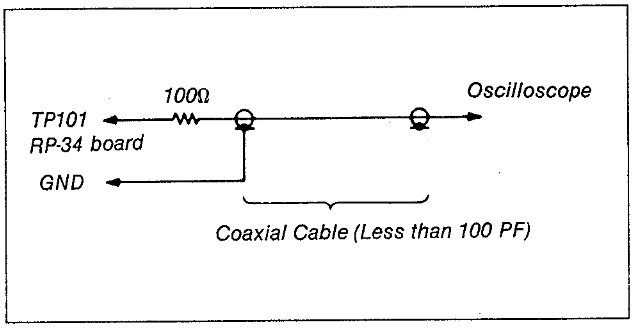


Fig. 9-24.

[Connection]

1) Connect the following two places of the MV-11 board with jumper wires:
   1. Pin ㉖ (REC Y RF) of the VY-8 board and GND
   2. CN201 pin ⑦ (PB ATF PILOT) and GND

[Adjustment Method]

1) Adjust to 9.0mVp-p with RV201 of the MV-11 board.

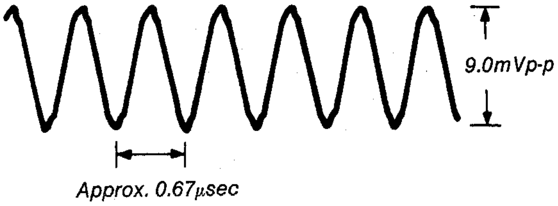


Fig. 9-25.

9-4-18. REC ATF Recording Current Adjustment (MV-11 board)

Mode	RECORD
Signal	None
Measurement point	TP101 (CH1 CHECK) of the RP-34 board
Measurement equipment	Oscilloscope
Adjustment element	RV202
Specified value	8.0mVp-p

Note:

1) Use MP type tape.
2) When a TP101 signal level of the RP-34 board is too low to read, connect directly through a 100Ω resistor as shown in the figure below instead of using a probe of 10:1.

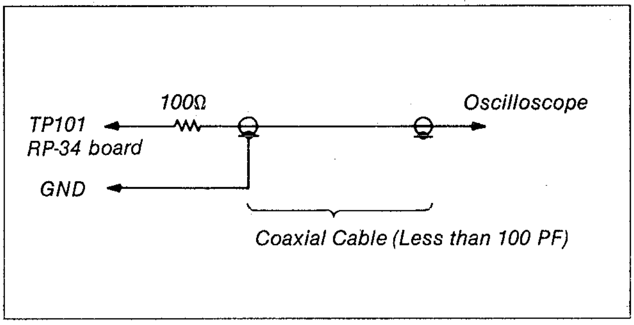

100Ω
TP101
RP-34 board
Oscilloscope
GND
Coaxial Cable (Less than 100 PF)

Fig. 9-26.

[Connection]

1) Connect the following two places in the MV-11 board with a jumper wire:
   - Pin ㉖ (REC Y RF) of the VY-8 board and GND
   - Pin ㉙ (REC AFM) of the AU-31 board and GND

[Adjustment Method]

1) Adjust to 8.0mVp-p with RV202.

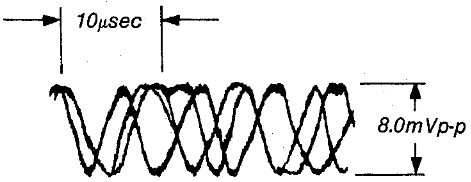

10μsec
8.0mVp-p

Fig. 9-27.

9-4-19. EVF Internal Display Position Adjustment (MV-11 Board)

Mode	CAMERA STANDBY
Subject	All black(Cover the lens with the food cap.)
Measurement point	Pin ② of CN207 (VF OUT)
Measurement equipment	Oscilloscope
Adjustment element	CV201
Specified value	8.5 ± 0.8μsec

[Adjustment Method]

1) Adjust to 8.5 ± 0.8μsec with CV201.

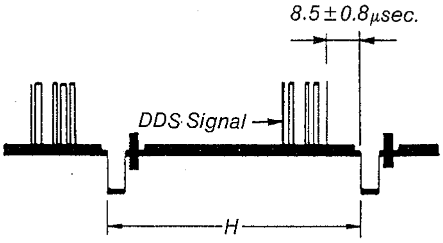

8.5 ± 0.8μsec.
DDS Signal
H

Fig. 9-28.

9-5. AUDIO SYSTEM ADJUSTMENT

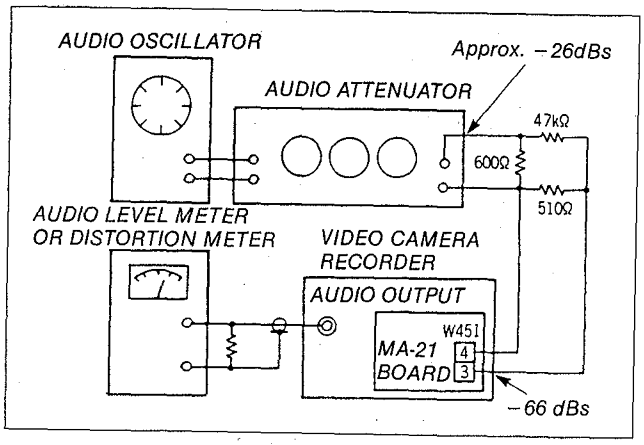


Fig. 9-29.

9-5-1. AFM Carrier Frequency Adjustment (AU-31 Board)

Mode	RECORD (SP mode)
Signal	None
Measurement point	Flat cable pin ㉙ (REC AFM) (IC401 pin ⑭)
Measurement equipment	Frequency counter
Adjustment element	RV401
Specified value	1.500 ± 0.002MHz

[Adjustment Method]

1) Adjust to 1.500 ± 0.002MHz with RV401

9-5-2. AFM Deviation Adjustment (AU-31 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP)
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Adjustment element	RV402
Specified value	−10 ± 0.2dBs

[Adjustment Method]

1) Adjust the audio output level to −10 ± 0.2dBs with RV402.

9-5-3. E-E Output Level Check

Mode	E-E
Signal	400Hz, −66dBs
Measurement point	See Fig. 9-29.
Measurement equipment	Audio level meter
Specified value	−10 ± 3dBs

[Checking Method]

1) Be sure the audio output level is −10 ± 3dBs.

9-5-4. Overall Level Characteristic Check

Mode	SELF RECORD & PLAYBACK
Signal	400Hz, −66dBs
Measurement point	See Fig. 9-29.
Measurement equipment	Audio level meter
Specified value	−10 ± 3dBs

[Checking Method]

1) Record signals.
2) Playback recorded portions.
3) The audio output level should be −10 ± 3dBs.

9-5-5. Overall Distortion Check

Mode	SELF RECORD & PLAYBACK
Signal	400Hz, −66dBs
Measurement point	See Fig. 9-29.
Measurement equipment	Distortion meter
Specified value	Less than 0.5%[*1]

[Checking Method]

1) Record signals.
2) Playback recorded portions.
3) A distortion should be less than 0.5%[*1].

[*1] This value applies when a distortion measuring filter (Fig. 9-30) is used (approx. 1.0% when the filter is not used).

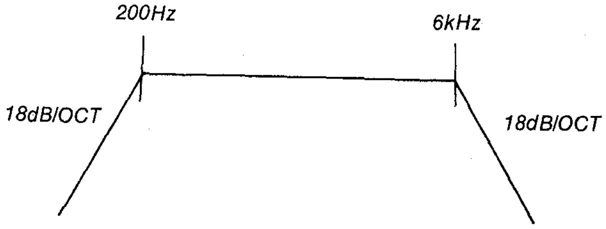


Fig. 9-30.

9-5-6. Overall Noise Level Check

Mode	SELF RECORD & PLAYBACK
Signal	None Short-circuit with a jumper wire between W451 pins ③ and ④ (GND) of the MA-21 board.
Measurement point	See Fig. 9-29.
Measurement equipment	Audio level meter
Specified value	Less than −56dBs[*2]

[Checking Method]

1) Record signals.
2) Playback recorded portions.
3) A noise level should be less than −56dBs.[*2]

[*2] This value applies when an IHF-A auditory correction filter is used.

9-6. ELECTRONIC VIEW FINDER SYSTEM ADJUSTMENT

9-6-1. Horizontal Slant Adjustment

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), monoscope portion
Specified value	See Fig. 9-31.

[Adjustment Method]

1) Adjust RV955 (BRIGHT) to provide easy-to-view brightness for the CRT.
2) Loosen the DY (Deflection Yoke) fastening band.
3) Rotate the DY to make a picture horizontal.
4) Adjust to 51.7±0.3mm a distance between the CRT surface and the rear end of the DY.
5) Tighten the DY fastening band. (Do not tighten too much.)

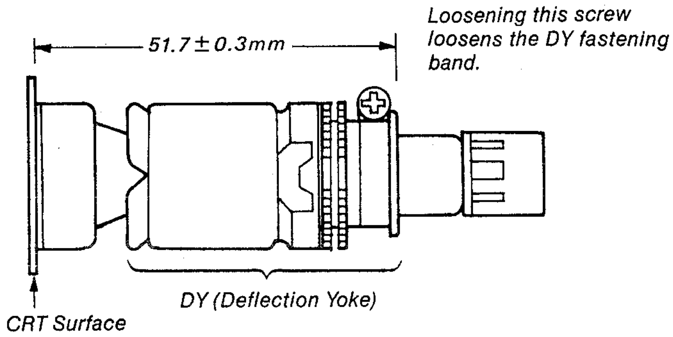
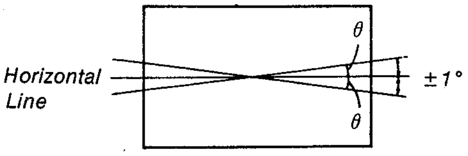

51.7±0.3mm
Loosening this screw loosens the DY fastening band.
DY (Deflection Yoke)
CRT Surface

Fig. 9-31.


θ
θ
Horizontal Line
±1°

Specified value: A picture should be within ±1° of the horizontal line.

Fig. 9-32.

9-6-2. Centering Adjustment

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), monoscope portion
Specified value	See Fig. 9-34.

[Adjustment Method]

1) Adjust the screen uniformly in both vertical and horizontal directions with the centering magnet.

Note:

Since a centering position changes due to an effect of terrestrial magnetism, rotate 360° in the horizontal direction and adjust at the center of displacement.

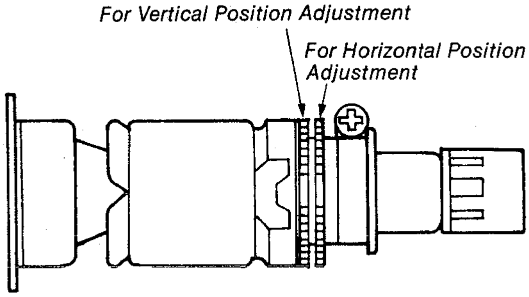
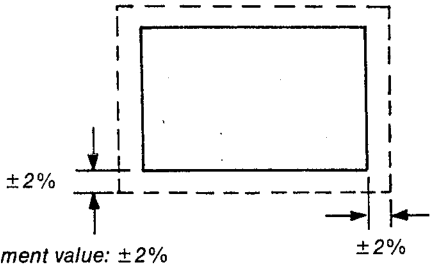

For Vertical Position Adjustment
For Horizontal Position Adjustment

Fig. 9-33.



Adjustment value: ±2%

Fig. 9-34.

9-6-3. AFC Adjustment (VF-8 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP)
Measurement point	Pin ⑲ of IC951
Measurement equipment	Digital voltmeter or oscilloscope (DC range)
Adjustment element	RV952
Specified value	2.65±0.1Vdc

[Adjustment Method]

1) Adjust to 2.65±0.1Vdc with RV952.

9-6-4. Horizontal Amplitude Adjustment (VF-8 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), monoscope portion
Adjustment element	C968, 969
Specified value	6±3%

[Adjustment Method]

1) Adjust a focus with RV954.
2) Turn RV951, and conform the top and bottom of a monoscope picture to the top and bottom edges of the screen.
3) Turn RV955 to obtain a normal level of brightness.
4) Short or open the patterns (A, B) of the H-size adjusting capacitors (C968 and C969) sequentially to adjust horizontal overscanning to 6±3% (total of right and left). (See Fig. 9-35)

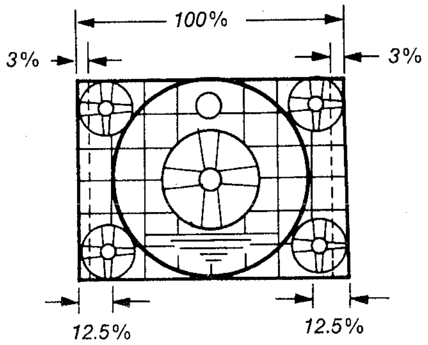
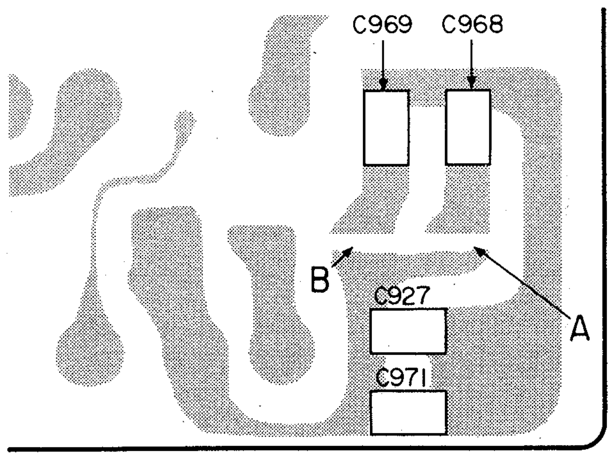

100%
3%
3%
12.5%
12.5%

Fig. 9-35.


C969
C968
B
C927
A
C971

A	B	H Size
Open	Open	Small
Short	Open	↑
Open	Short	↓
Short	Short	Large

Fig. 9-36.

9-6-5. Vertical Amplitude Adjustment (VF-8 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), monoscope portion
Adjustment element	RV951
Specified value	6±3%

[Adjustment Method]

1) Adjust vertical overscanning to 6±3% (total of top and bottom) with RV951.

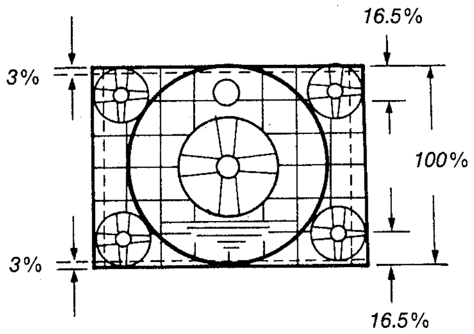

16.5%
3%
100%
3%
16.5%

Fig. 9-37.

9-6-6. Brightness and Contrast Adjustment (VF-8 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), monoscope portion
Adjustment element	Brightness: RV955 Contrast: RV953

[Adjustment Method]

1) Adjust RV955 and RV953 alternately so that the light and shade of the gray scale will be correctly displayed.
(The light area should not be so bright that the cross hatch inside the monoscope circle becomes dim. The shade area should not be so dark that the darkest and second darkest parts of the gray scale cannot be distinguished from each other.)

9-6-7. Focus Adjustment (VF-8 Board)

Mode	PLAYBACK
Signal	Alignment tape for operation checking (WR5-3NSP), monoscope portion
Adjustment element	RV954

[Adjustment Method]

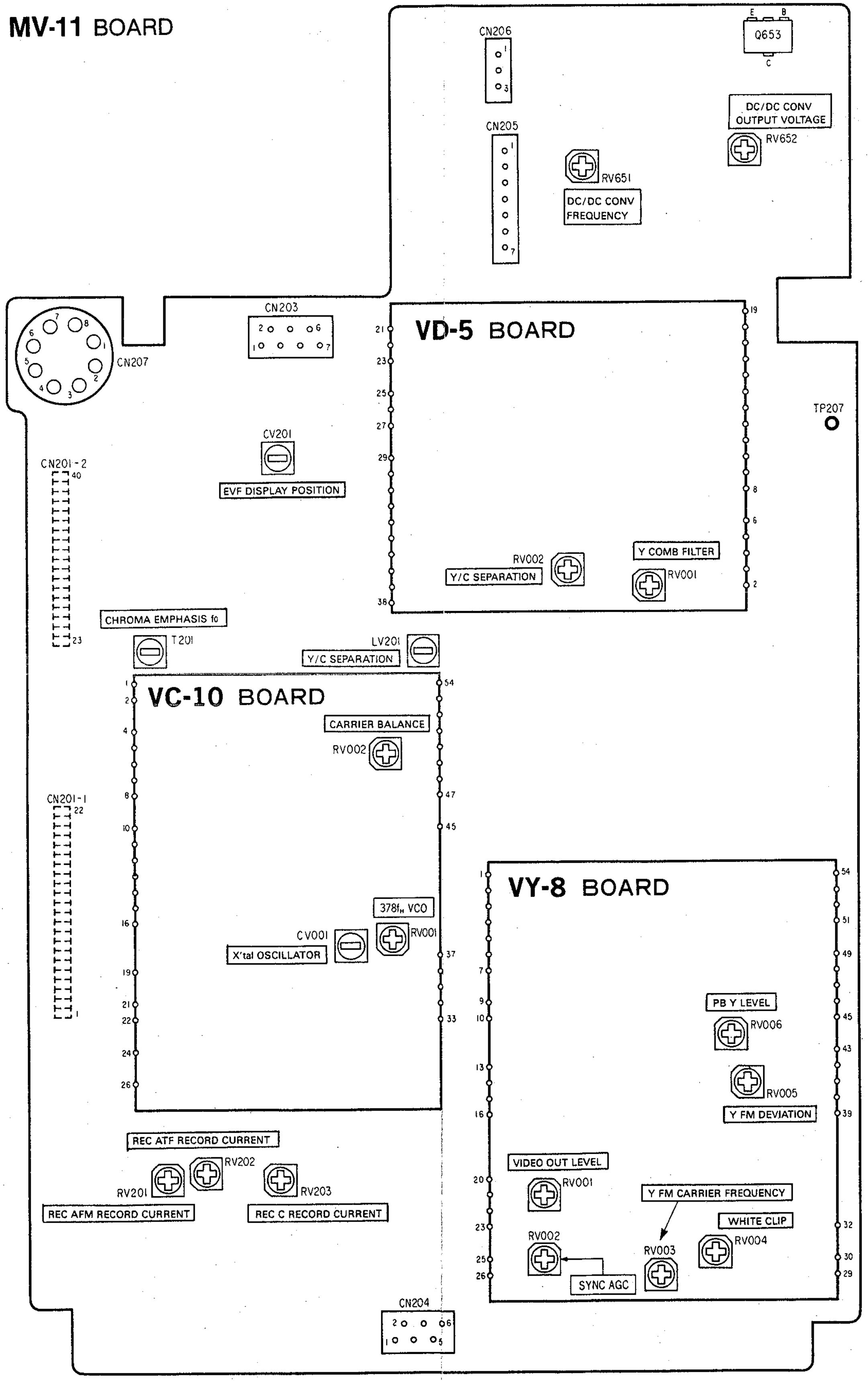
1) Adjust to the best focus point with RV954.

9-6-8. Horizontal and Vertical Amplitude Confirmation

Results of horizontal amplitude adjustment in 9-6-4 and vertical amplitude adjustment in 9-6-5 should meet their specified values, respectively. If not met, make readjustments. In this case, carry out both brightness and contrast adjustment in 9-6-6 and focus adjustment in 9-6-7 again.

9-7. ADJUSTMENT ELEMENT LOCATION

MV-11 BOARD


CN206
Q653
E
B
C
DC/DC CONV OUTPUT VOLTAGE
RV652
CN205
RV651
DC/DC CONV FREQUENCY
CN203
CN207
VD-5 BOARD
TP207
CV201
EVF DISPLAY POSITION
CN201-2
RV002
Y/C SEPARATION
Y COMB FILTER
RV001
CHROMA EMPHASIS f0
T201
LV201
Y/C SEPARATION
VC-10 BOARD
CARRIER BALANCE
RV002
CN201-1
378fH VCO
CV001
RV001
X'tal OSCILLATOR
VY-8 BOARD
PB Y LEVEL
RV006
RV005
Y FM DEVIATION
REC ATF RECORD CURRENT
RV202
RV201
RV203
REC AFM RECORD CURRENT
REC C RECORD CURRENT
VIDEO OUT LEVEL
RV001
Y FM CARRIER FREQUENCY
WHITE CLIP
RV002
RV003
RV004
SYNC AGC
CN204

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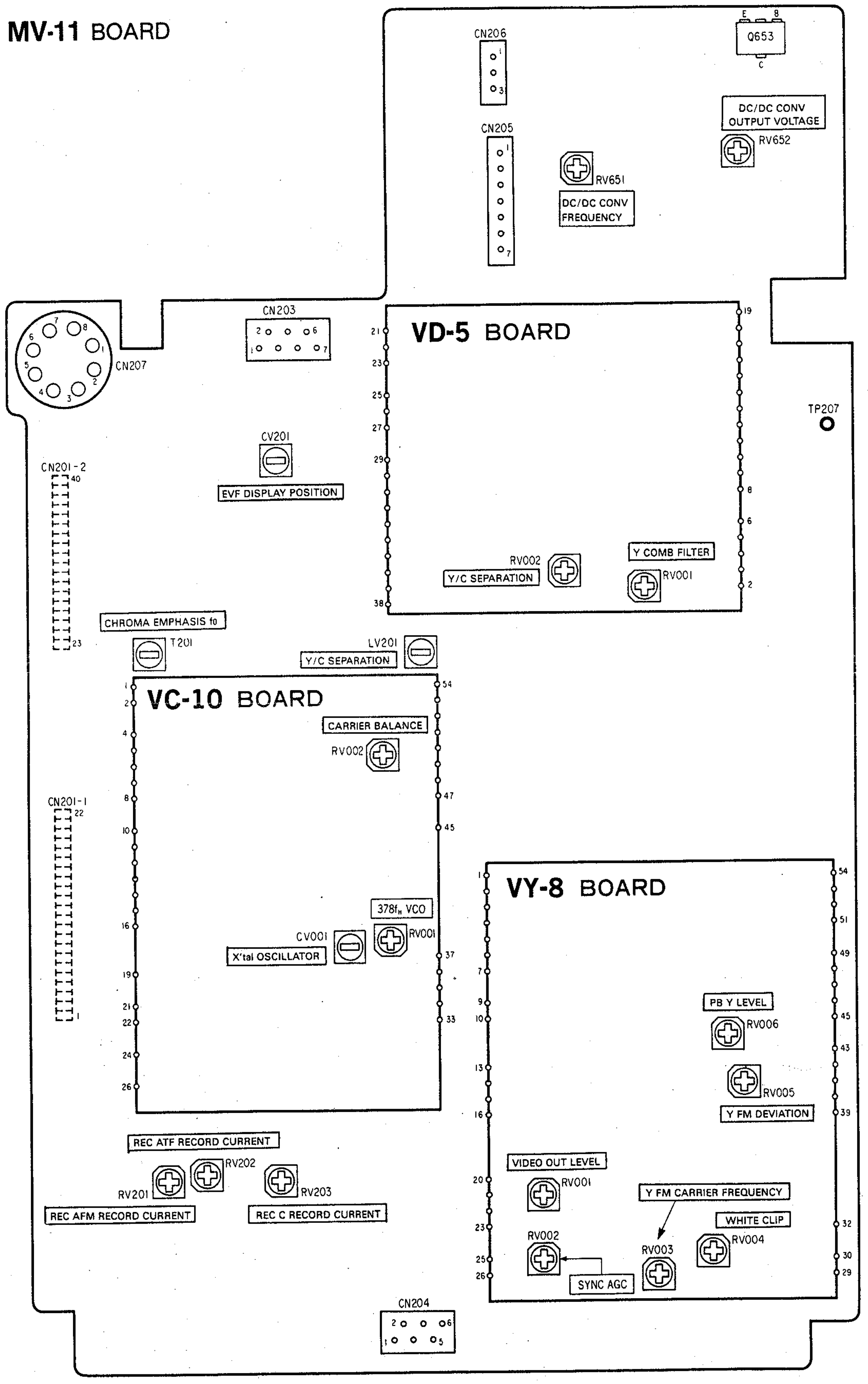
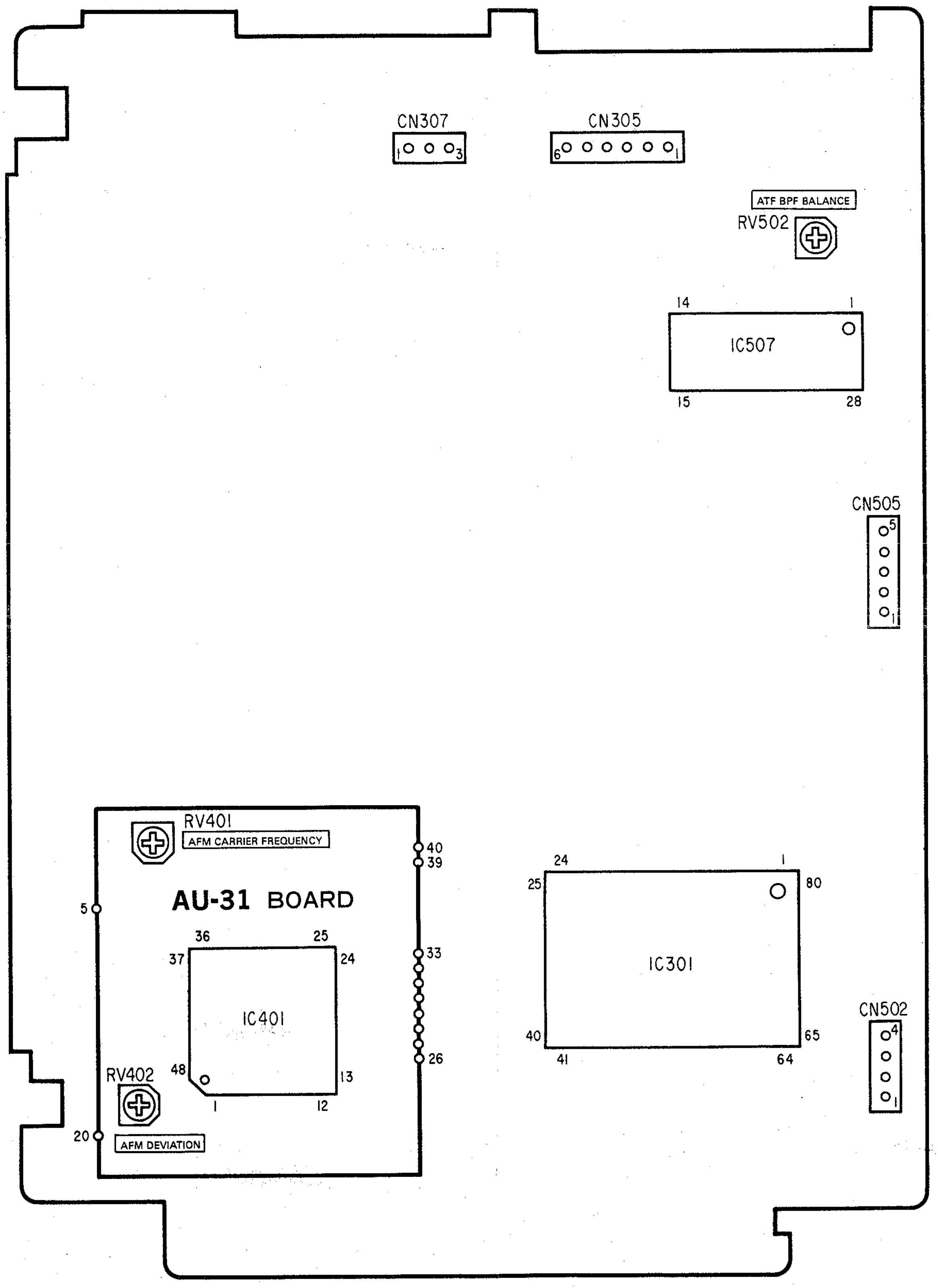
9-7. ADJUSTMENT ELEMENT LOCATION

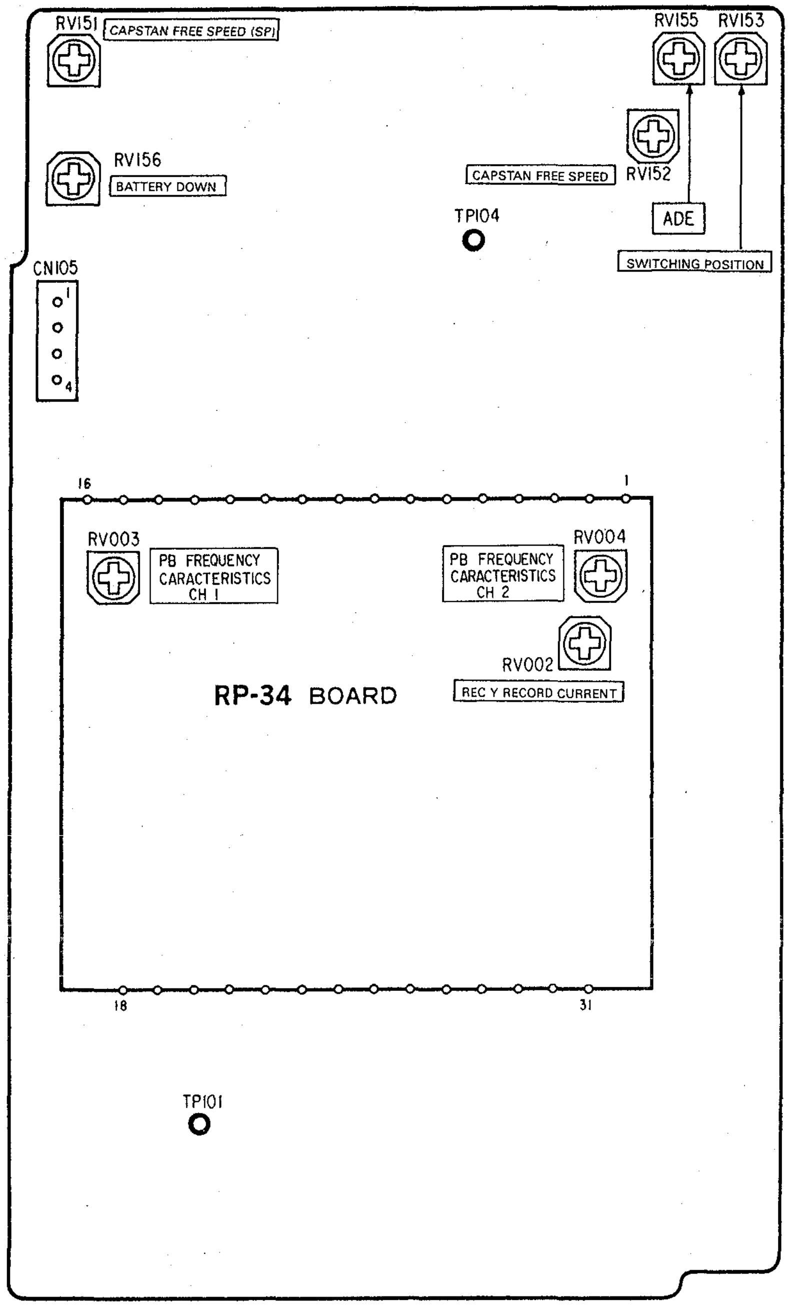
MV-11 BOARD


CN206
Q653
E
B
C
CN205
DC/DC CONV OUTPUT VOLTAGE
RV652
RV651
DC/DC CONV FREQUENCY
CN203
CN207
VD-5 BOARD
TP207
CV201
EVF DISPLAY POSITION
CN201-2
RV002
Y/C SEPARATION
Y COMB FILTER
RV001
CHROMA EMPHASIS f0
T201
LV201
Y/C SEPARATION
VC-10 BOARD
CARRIER BALANCE
RV002
CN201-1
378fH VCO
CV001
RV001
X'tal OSCILLATOR
VY-8 BOARD
PB Y LEVEL
RV006
RV005
Y FM DEVIATION
REC ATF RECORD CURRENT
RV202
RV201
RV203
REC AFM RECORD CURRENT
REC C RECORD CURRENT
VIDEO OUT LEVEL
RV001
Y FM CARRIER FREQUENCY
WHITE CLIP
RV004
RV002
RV003
SYNC AGC
CN204

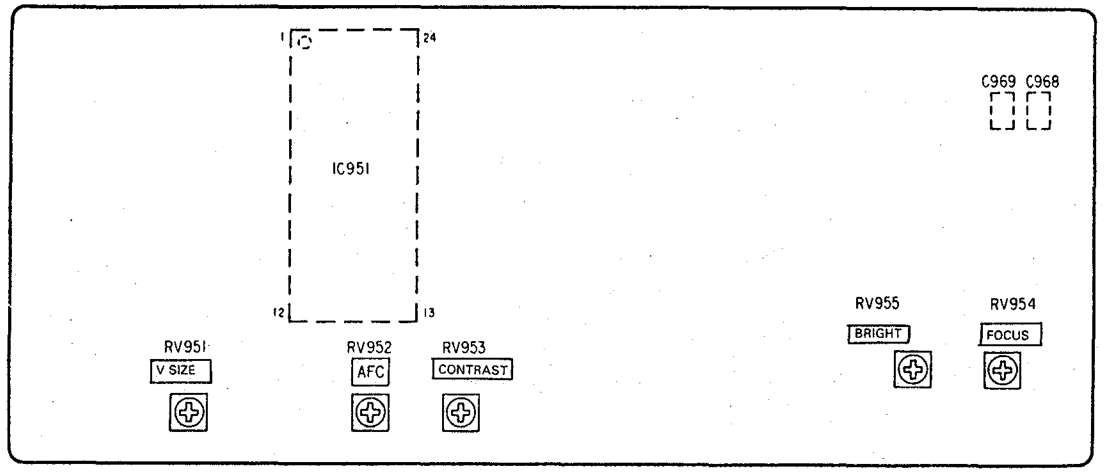
SS-70 BOARD


CN307
CN305
ATF BPF BALANCE
RV502
IC507
CN505
RV401
AFM CARRIER FREQUENCY
AU-31 BOARD
IC401
RV402
AFM DEVIATION
IC301
CN502

MR-8 BOARD


RV151
CAPSTAN FREE SPEED (SP)
RV155
RV153
RV156
BATTERY DOWN
CAPSTAN FREE SPEED
RV152
ADE
TP104
SWITCHING POSITION
CN105
1
4
16
1
RV003
PB FREQUENCY CARACTERISTICS CH 1
PB FREQUENCY CARACTERISTICS CH 2
RV004
RV002
REC Y RECORD CURRENT
RP-34 BOARD
18
31
TP101

VF-8 BOARD


1
24
IC951
12
13
C969
C968
RV955
BRIGHT
RV954
FOCUS
RV951
V SIZE
RV952
AFC
RV953
CONTRAST

CCD-V5/V50

SONY®

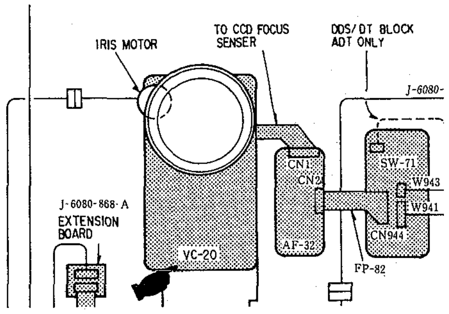
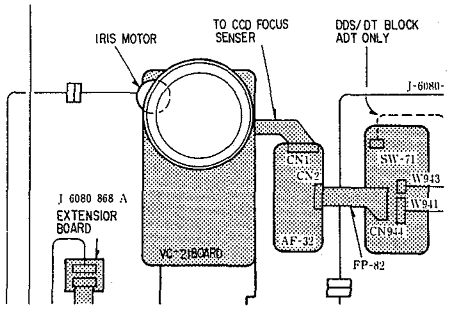
SERVICE MANUAL

US Model
Canadian Model
CCD-V5
E Model
CCD-V50

CORRECTION-1

Please correct your service manual

☛ : Corrected Portion

Page	CORRECT	INCORRECT
196	**5-6. CHASSIS ASSEMBLY (2)** No. · Part No. · Description · Remark ☛ 285 · A-7048-062-A · DRUM ASSY (DGU-16A-R) · 286-290 286 · 3-686-422-01 · WASHER (2X2.7), BOLT, HOLE 287 · 3-686-403-01 · SCREW (2X5), BOLT WASHER ☛ 288 · A-7049-095-A · DRUM ASSY, UPPER (DGR-16-R)	**5-6. CHASSIS ASSEMBLY (2)** No. · Part No. · Description · Remark 285 · A-7048-081-A · DRUM ASSY (DGU-19A-R) · 286-290 286 · 3-686-422-01 · WASHER (2X2.7), BOLT, HOLE 287 · 3-686-403-01 · SCREW (2X5), BOLT WASHER 288 · A-7049-107-A · DRUM ASSY, UPPER (DGR-19-R)
219	ACCESSORIES AND PACKING MATERIALS ********************************* Part No. · Description ☛ *3-719-812-11 · CARTON, OUTER (US/CANADIAN MODEL) ☛ *3-719-812-21 · CARTON, OUTER (E MODEL)	ACCESSORIES AND PACKING MATERIALS ********************************* Part No. · Description *3-719-812-11 · CARTON, OUTER
221	*Fig. 7-3.*  IRIS MOTOR TO CCD FOCUS SENSER DDS/DT BLOCK ADT ONLY J-6080- CN1 CN2 SW-71 W943 W941 CN944 J-6080-868-A EXTENSION BOARD VC-20 AF-32 FP-82	*Fig. 7-3.*  IRIS MOTOR TO CCD FOCUS SENSER DDS/DT BLOCK ADT ONLY J-6080- CN1 CN2 SW-71 W943 W941 CN944 J 6080 868 A EXTENSIOR BOARD VC-21BOARD AF-32 FP-82

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Consumer Video Group

English
8710453-1
Printed in Japan
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VIDEO

CCD-V5/V50

SONY®
SERVICE MANUAL

REVISED

US Model
Canadian Model
CCD-V5
E Model
CCD-V50

CORRECTION-2

Please correct your service manual.
Discard your CCD-V5/V50 CORRECTION-2
for US/Canadian/E Model Previously issued.

☞ : **Corrected Portion**

<table>
<tr><th>Page</th><th>INCORRECT</th><th>CORRECT</th></tr>
<tr><td>191</td><td>5-1. CABINET ASSEMBLY
No. Part No. Description
2 ⋆X-3712-046-1 LID ASSY, LS CASSETTE
18 ⋆X-3712-170-1 LID ASSY, CASSETTE</td><td>5-1. CABINET ASSEMBLY
No. Part No. Description
2 ⋆X-3712-170-1 LID ASSY, CASSETTE ☞
18 ⋆X-3712-046-1 LID ASSY, LS CASSETTE ☞</td></tr>
<tr><td>220</td><td>7-1. LIST OF SERVICING JIGS
<table><tr><th>Ref. No.</th><th>Name</th><th>Part Code</th></tr><tr><td>J-7</td><td>Lens block fixing jig</td><td>J-6094-894-A</td></tr></table></td><td>7-1. LIST OF SERVICING JIGS
<table><tr><th>Ref. No.</th><th>Name</th><th>Part Code</th></tr><tr><td>J-7</td><td>Lens block fixing jig</td><td>J-6080-894-A ☞</td></tr></table></td></tr>
<tr><td>253</td><td>8-2-5. Service Jig Table
<table><tr><th>Ref. No.</th><th>Name</th><th>Part No.</th></tr><tr><td>J-9</td><td>FWD and RVS winding torque cassette</td><td>J-6080-624-A</td></tr></table></td><td>8-2-5. Service Jig Table
<table><tr><th>Ref. No.</th><th>Name</th><th>Part No.</th></tr><tr><td>J-9</td><td>FWD and RVS winding torque cassette</td><td>J-6080-824-A ☞</td></tr></table></td></tr>
</table>

9-972-569-93

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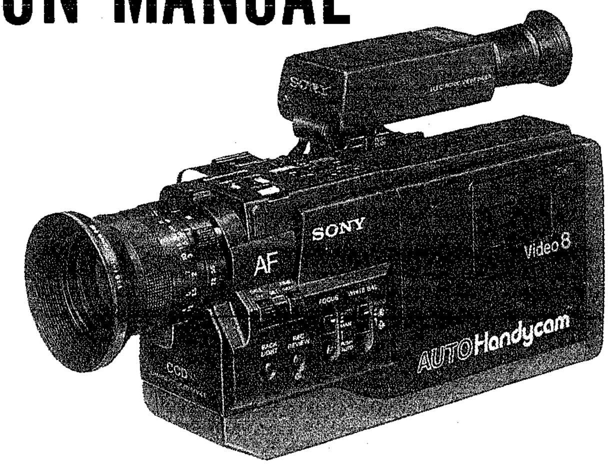
CCD-V5/V50

OPERATION MANUAL



US Model
Canadian Model
CCD-V5

E Model
CCD-V50

AUTO Handycam
Video 8

This Operation Manual deals only with the DT (Digital Titler)/DDS (date and time) circuits. Refer to the CCD-V3/V30 Operation Manual for the circuits of the other sections (camera section. VTR section).

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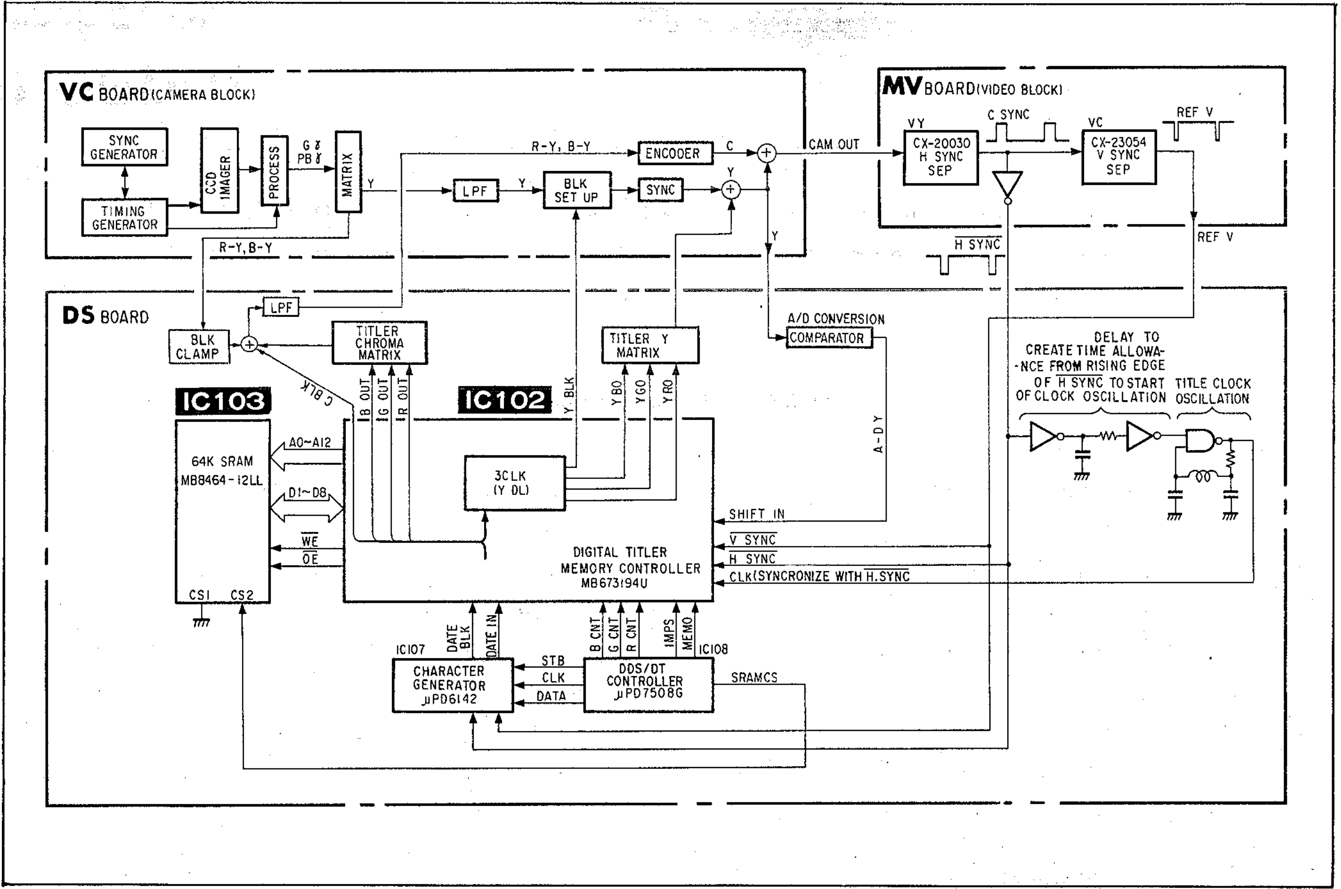
8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

1. DIGITAL TITLER

The purpose of this circuit to allow easy creation of title screens by use of the Handycam alone.
The color output video signal (title signal) is 1-bit quantized, and the sync signal separated from the camera output video signal is used to store this data in the 64 k bit S RAM (static RAM).
This title signal stored in the memory is superimposed on the camera output signal during shooting for the easy creation of title screens.



VC BOARD (CAMERA BLOCK)
SYNC GENERATOR
TIMING GENERATOR
CCD IMAGER
PROCESS
G γ
PB γ
MATRIX
Y
R-Y, B-Y
ENCODER
C
LPF
Y
BLK SET UP
SYNC
Y
Y
CAM OUT
R-Y, B-Y
MV BOARD (VIDEO BLOCK)
VY
CX-20030 H SYNC SEP
C SYNC
VC
CX-23054 V SYNC SEP
REF V
REF V
$\overline{\text{H SYNC}}$
DS BOARD
LPF
BLK CLAMP
TITLER CHROMA MATRIX
C BLK
IB OUT
IG OUT
IR OUT
IC103
IC102
Y BLK
TITLER Y MATRIX
Y BO
Y GO
Y RO
A/D CONVERSION
COMPARATOR
A-DY
DELAY TO CREATE TIME ALLOWANCE FROM RISING EDGE OF $\overline{\text{H SYNC}}$ TO START OF CLOCK OSCILLATION
TITLE CLOCK OSCILLATION
64K SRAM
MB8464-12LL
A0~A12
D1~D8
$\overline{\text{WE}}$
$\overline{\text{OE}}$
CS1
CS2
3CLK (Y DL)
DIGITAL TITLER MEMORY CONTROLLER
MB673194U
SHIFT IN
$\overline{\text{V SYNC}}$
$\overline{\text{H SYNC}}$
CLK (SYNCRONIZE WITH $\overline{\text{H.SYNC}}$
IC107
DATE BLK
DATE IN
B CNT
G CNT
R CNT
IMPS
MEMO
IC108
CHARACTER GENERATOR
μPD6142
STB
CLK
DATA
DDS/DT CONTROLLER
μPD7508G
SRAMCS

Fig. 1-1. System block diagram

1-1. D-A CONVERSION CIRCUIT

[Objective]

The title signal (Y signal) shot by the camera is converted to two-value, "H" and "L",digital signal.

[Operation]

1. The high frequency components of the Y signal from the camera block are eliminated by the active LPF Q102 (cutoff frequency = approx. 2 MHz) ,and after the sync tips of the signal are clamped to 2.2 Vdc by Q110 and 111, it is input to pin ③ of comparator IC104.
2. The reference voltage (approx. 2.85Vdc) set by RV102 is input to Pin ② of comparator IC104. The voltage corresponds to the 50% white voltage of the Y signal (amplitude 1 V_{p-p}, sync tip approx. 2.2Vdc) input to Pin③.
3. Comparator output Pin ⑦ of IC104 is "L"when the Y signal voltage input to Pin③ is higher than 2.85Vdc and "H" when lower. In other words, it is "L" when the luminance is higher than 50% white and "H" when lower.

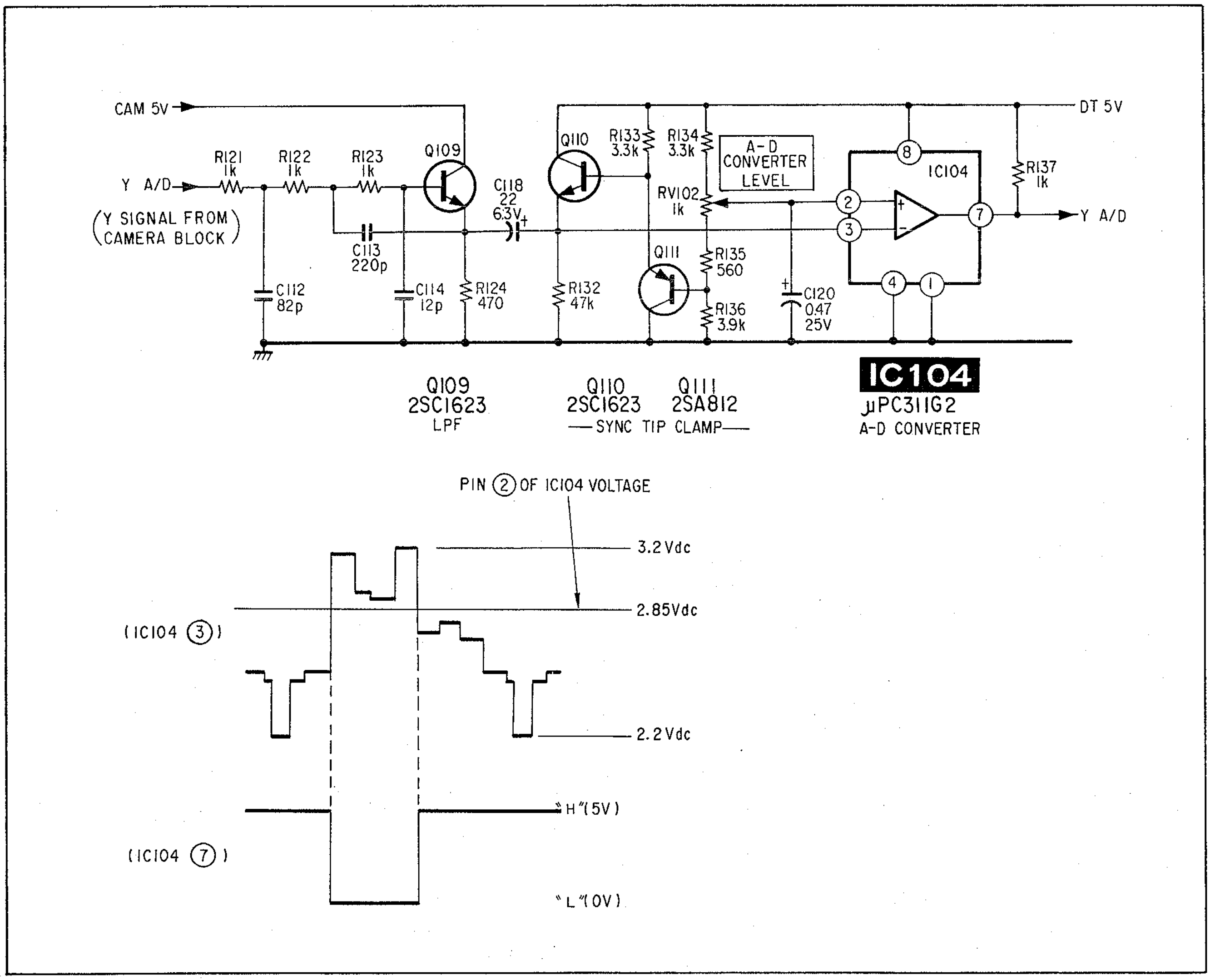

CAM 5V
DT 5V
Y A/D
(Y SIGNAL FROM CAMERA BLOCK)
R121 1k
R122 1k
R123 1k
Q109
C118 22 6.3V
C113 220p
C112 82p
C114 12p
R124 470
Q110
R133 3.3k
R134 3.3k
A-D CONVERTER LEVEL
RV102 1k
R132 47k
Q111
R135 560
R136 3.9k
C120 0.47 25V
IC104
R137 1k
Y A/D
Q109 2SC1623 LPF
Q110 2SC1623
Q111 2SA812
SYNC TIP CLAMP
IC104
µPC311G2
A-D CONVERTER
PIN ② OF IC104 VOLTAGE
3.2Vdc
2.85Vdc
2.2Vdc
(IC104 ③)
"H"(5V)
(IC104 ⑦)
"L"(0V)

Fig. 1-2.

1-2. SHIFT REGISTER

[Objective]

The A-D converted Y signal is sampled at a period of 193.8nsec (191.2nsec for PAL models) and coverted to 8-bit parallel data for storage in the S RAM (static RAM).

[Operation]

1. The A-D converted Y signal is input to the internal shift register of IC102 from Pin ㊴ of IC102.
2. The shift register is configured from two 8-bit shift registers, and while one is sampling the A-D Y signal, the other is writing the sampled 8-bit data to the S RAM.
3. Shift register 1 is synchronized to the clock (SCK 1) generated by the timing generator,and it samples the A-D Y signal (period of 193.8nsec for NTSC, 191.2nsec for PAL).
During this interval, shift register 2 writes the sampled data to the S RAM (static RAM : IC103).
4. When shift register 1 completes sampling of 8 bit data, the two shift registeres switch roles. Shift register 1 starts writing of the 8-bit data to the S RAM (static RAM : IC103), and shift register 2 starts the sampling of the A-D Y signal.
5. The data write to the S RAM is performed for all 8 bits simultaneously as 8-bit parallel data (output from Pins ⑪ to ⑱ of IC102). Thus, the data write period is 193.8 × 8 = 1550.4nsec (NTSC) or 191.2 × 8 = 1529.6nsec (PAL).

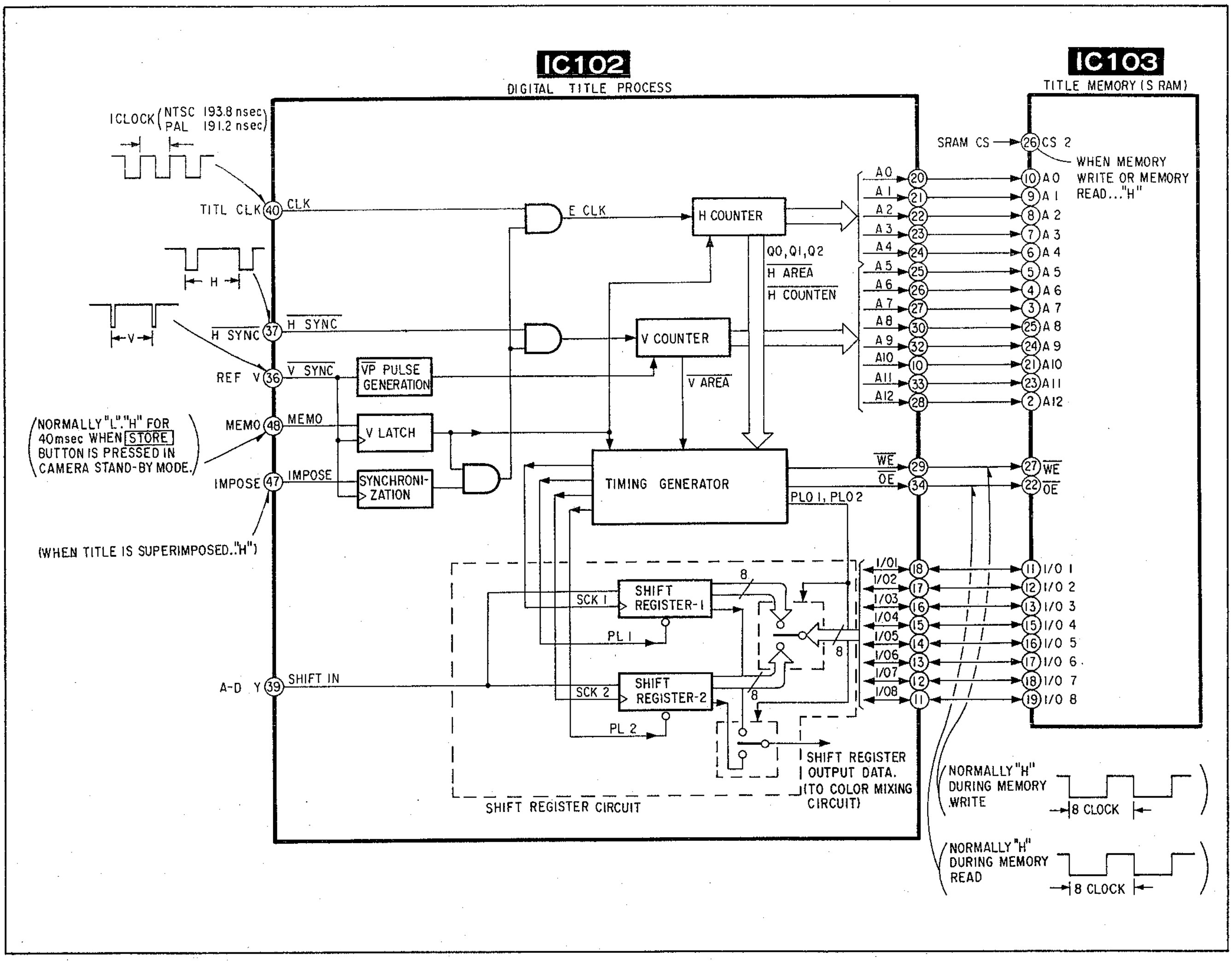

IC102
DIGITAL TITLE PROCESS
IC103
TITLE MEMORY (S RAM)
ICLOCK (NTSC 193.8 nsec / PAL 191.2 nsec)
TITL CLK ㊵
CLK
E CLK
H COUNTER
Q0, Q1, Q2
H AREA
H COUNTEN
H
V
H SYNC ㊲
H SYNC
V COUNTER
V AREA
REF V ㊱
V SYNC
VP PULSE GENERATION
(NORMALLY "L". "H" FOR 40msec WHEN STORE BUTTON IS PRESSED IN CAMERA STAND-BY MODE.)
MEMO ㊽
MEMO
V LATCH
IMPOSE ㊼
IMPOSE
SYNCHRONI-ZATION
(WHEN TITLE IS SUPERIMPOSED.:"H")
TIMING GENERATOR
PLO 1, PLO 2
SRAM CS
CS 2
WHEN MEMORY WRITE OR MEMORY READ..."H"
A0 ⑳ ⑩ A0
A1 ㉑ ⑨ A1
A2 ㉒ ⑧ A2
A3 ㉓ ⑦ A3
A4 ㉔ ⑥ A4
A5 ㉕ ⑤ A5
A6 ㉖ ④ A6
A7 ㉗ ③ A7
A8 ㉚ ㉕ A8
A9 ㉜ ㉔ A9
A10 ⑩ ㉑ A10
A11 ㉝ ㉓ A11
A12 ㉘ ② A12
WE ㉙ ㉗ WE
OE ㉞ ㉒ OE
I/O1 ⑱ ⑪ I/O 1
I/O2 ⑰ ⑫ I/O 2
I/O3 ⑯ ⑬ I/O 3
I/O4 ⑮ ⑮ I/O 4
I/O5 ⑭ ⑯ I/O 5
I/O6 ⑬ ⑰ I/O 6
I/O7 ⑫ ⑱ I/O 7
I/O8 ⑪ ⑲ I/O 8
SHIFT REGISTER-1
SCK 1
PL 1
SHIFT REGISTER-2
SCK 2
PL 2
8
A-D Y ㊴
SHIFT IN
SHIFT REGISTER CIRCUIT
SHIFT REGISTER OUTPUT DATA. (TO COLOR MIXING CIRCUIT)
(NORMALLY "H" DURING MEMORY WRITE
8 CLOCK
(NORMALLY "H" DURING MEMORY READ
8 CLOCK

Fig. 1-3

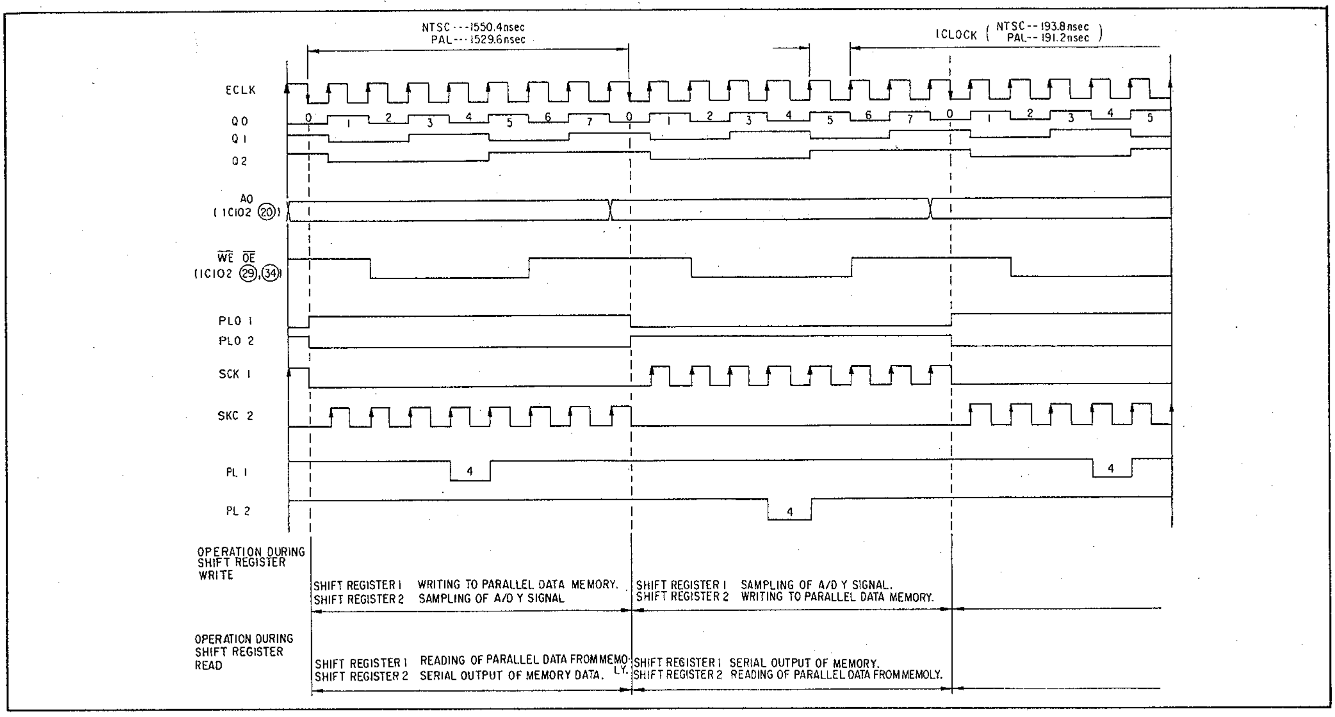

NTSC---1550.4nsec
PAL---1529.6nsec
ICLOCK (NTSC--193.8nsec
PAL--191.2nsec)
ECLK
Q0
Q1
Q2
0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5
A0
(IC102 ⑳)
$\overline{WE}$ $\overline{OE}$
(IC102 ㉙,㉞)
PLO 1
PLO 2
SCK 1
SKC 2
PL 1
PL 2
4
4
4
OPERATION DURING SHIFT REGISTER WRITE
SHIFT REGISTER 1 WRITING TO PARALLEL DATA MEMORY.
SHIFT REGISTER 2 SAMPLING OF A/D Y SIGNAL
SHIFT REGISTER 1 SAMPLING OF A/D Y SIGNAL.
SHIFT REGISTER 2 WRITING TO PARALLEL DATA MEMORY.
OPERATION DURING SHIFT REGISTER READ
SHIFT REGISTER 1 READING OF PARALLEL DATA FROMMEMOLY.
SHIFT REGISTER 2 SERIAL OUTPUT OF MEMORY DATA.
SHIFT REGISTER 1 SERIAL OUTPUT OF MEMORY.
SHIFT REGISTER 2 READING OF PARALLEL DATA FROMMEMOLY.

Fig. 1-4. Operation timing chart of shift register

1-3. WRITING TITLE DATA TO MEMORY (S RAM : IC103)

[Objective]

The address in the memory (S RAM : IC103) is designated and the title data is written 8 bits at a time. The data stored in the memory is the section for 1 field with the horizontal and vertical blanking sections omitted, to allow effective use of the memory capacity.

[Operation]

1. The write address is generated by the H counter and V counter within IC102. The address is split into the H address (A0 to A4) and the V address (A5 to A12). The V address indicates the scanning line No. (0 to 255) of the write data.
   Thus, this address is incremented every 1H (63.56μsec for NTSC, 64.00μsec for PAL).
   The H address indicates the position (0 to 31) on the scanning line.
2. The 8-bit title data sampled by the IC102 shift register is output from Pins ⑪ to ⑱ as parallel data with a cycle of 1550.4nsec for NTSC and 1529.6nsec for PAL. The H address (A0 to A4 : Pins ⑳ to ㉔) is incremented by 1 synchronized with data output.
3. The $\overline{WE}$ signal (Pin ㉙ of IC102) output from the timing generator changes from "H" to "L". The write address for the memory (IC103) is determined at this falling edge of the $\overline{WE}$ signal.
4. The $\overline{WE}$ signal goes from "L" to "H" 4 clocks (0.775μsec for NTSC, 0.765μsec for PAL) after the $\overline{WE}$ signal falls. The 8-bit title data output from the shift register is stored in the memory by this rising edge of the $\overline{WE}$ signal.

1-4. READING TITLE DATA FROM MEMORY (S RAM : IC103)

[Objective]

The address in the memory (S RAM : IC103) is designated and the title data is output 8 bits at a time. the read 8-bit data is converted to a serial signal by the shift register.

[Operation]

1. In the same manner as memory write, the read address is generated by the H counter and V counter within IC102.
2. The $\overline{OE}$ signal (Pin ㉞ of IC102) output from the timing generator changes from "H" to "L". This falling edge of the $\overline{OE}$ signal determines the memory (IC103) read address.
3. The $\overline{OE}$ signal changes from "L" to "H" 4 clocks after it falls. This rising edge of the $\overline{OE}$ signal writes 8-bit title data into the shift register from the designated read address in the memory.
4. The shift register synchronizes the 8-bit data read from the memory to the clock (SCK1 or SCK2) and outputs it in order.
   The shift register is comprised of shift register 1 and shift register 2, and while one is reading title data from the memory, the other performs serial output of the read data.

1-5. COLOR MIXING CIRCUIT

The color mixing circuit is divided into the title chroma signal synthesis circuit and title Y signal synthesis circuit.

[Title chroma signal synthesis]

The title chroma signal is comprised of the three R OUT , G OUT, and B OUT signals and the C BLK signal. The shift register output signal is used unchanged for the C BLK signal. The three R OUT, G OUT, and B OUT signals are obtained by an AND with the shift register output signal and the R CONT, G CONT and B CONT signals, and these vary according to the title color as shown in the table below.

Title color	White(WHT)	Blue(BLUE)	Green(GRN)	Cyan(CYAN)	Red(RED)	Violet(VIO)	Yellow(YEL)	Black(BLK)
R CONT	H	L	L	L	H	H	H	L
G CONT	H	L	H	H	L	L	H	L
B CONT	H	H	L	H	L	H	L	L
R OUT	TITLE	L	L	L	TITLE	TITLE	TITLE	L
G OUT	TITLE	L	TITLE	TITLE	L	L	TITLE	L
B OUT	TITLE	TITLE	L	TITLE	L	TITLE	L	L

※"TITLE" indicates that the shift register output signal is output.

[Title Y signal synthesis]

As it is necessary to change the title luminance according to the title color, the title Y signal is comprised of the three Y_R OUT, Y_G OUT, and Y_B OUT signals and the Y BLK signal, in the same manner as the title chroma signal. The title Y signal is synthesized in the same manner as title chroma signal except that shift register output is delayed three clocks (581.4nsec for NTSC, 573.6nsec for PAL). This delay circuit corrects the delay of the title chroma signal in relation to the title Y signal caused by the narrow frequency bandwidth of the chroma signal.

The DATE IN signal and DATE BLK signal are input to the title Y signal synthesis circuit from the character generator (IC107). These two signals are for superimposing of the date or time on the camera video signal, and both signals are "L" when this operation is not performed.

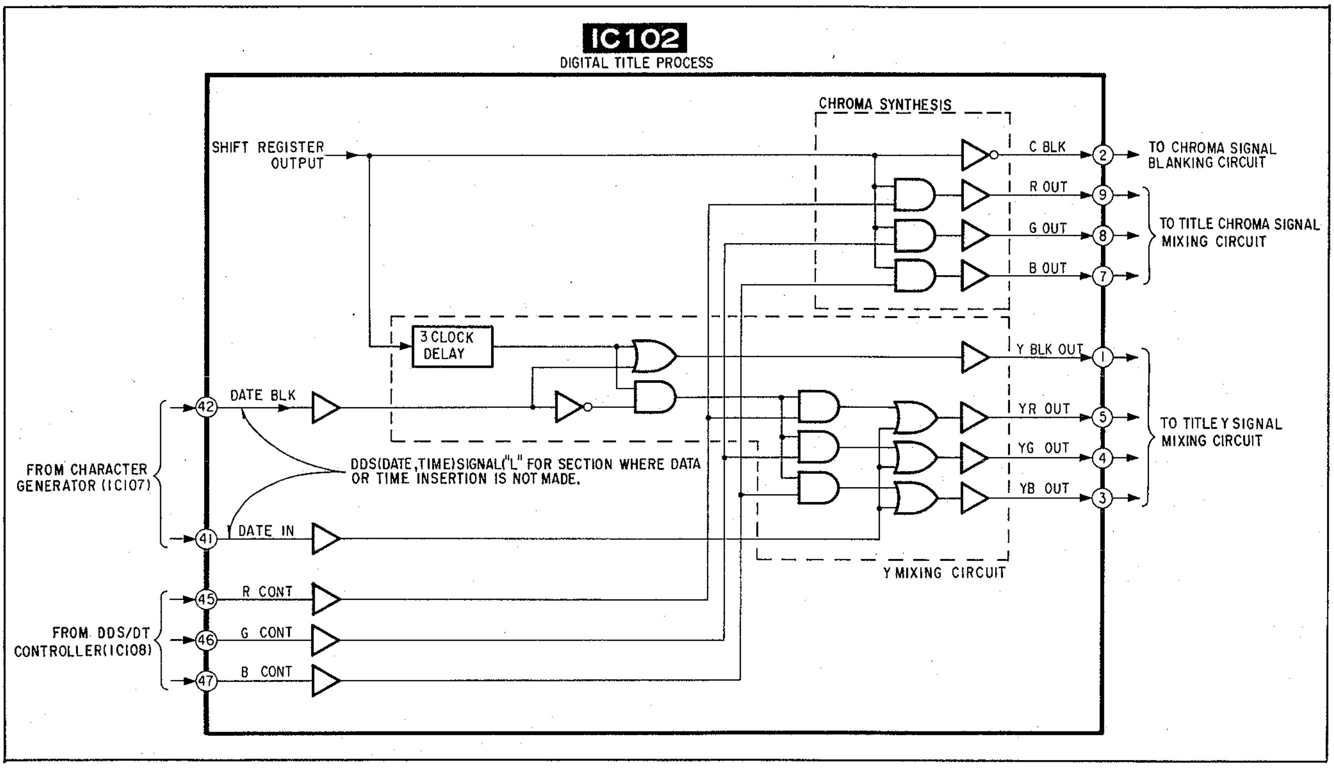

IC102
DIGITAL TITLE PROCESS
CHROMA SYNTHESIS
SHIFT REGISTER OUTPUT
C BLK
2
TO CHROMA SIGNAL BLANKING CIRCUIT
R OUT
9
G OUT
8
B OUT
7
TO TITLE CHROMA SIGNAL MIXING CIRCUIT
3 CLOCK DELAY
Y BLK OUT
1
DATE BLK
42
YR OUT
5
YG OUT
4
YB OUT
3
TO TITLE Y SIGNAL MIXING CIRCUIT
FROM CHARACTER GENERATOR (IC107)
DDS(DATE,TIME)SIGNAL("L" FOR SECTION WHERE DATA OR TIME INSERTION IS NOT MADE.
41
DATE IN
Y MIXING CIRCUIT
45
R CONT
FROM DDS/DT CONTROLLER(IC108)
46
G CONT
47
B CONT

Fig. 1-5. Color mixing circuit

1-6. CHROMA SIGNAL CLAMP/BLANKING CIRCUIT

[Objective]

The color difference signals are clamped and the title signal insertion section is blanked as pre-processing for insertion of the title signal into the color difference signals, R−Y and B−Y, from the camera clock.

[Operation]

1. The color difference signals, R−Y and B−Y, from the camera block are input to Pins ⑬ and ⑩ of IC101 respectively and the horizontal blanking section is clamped by the clamp circuit. The timing signal for clamping is the CLP2 signal input to Pin ②, and this signal is the H period pulse of the horizontal blanking period "H".
2. The color difference signals are next input to the blanking circuit and the title signal insertion section is replaced by the voltage (blanking level) set by RV101. The control signal for replacement is the C BLK signal input to Pin ④ , and it is normally an "L" pulse at "H" title sections.

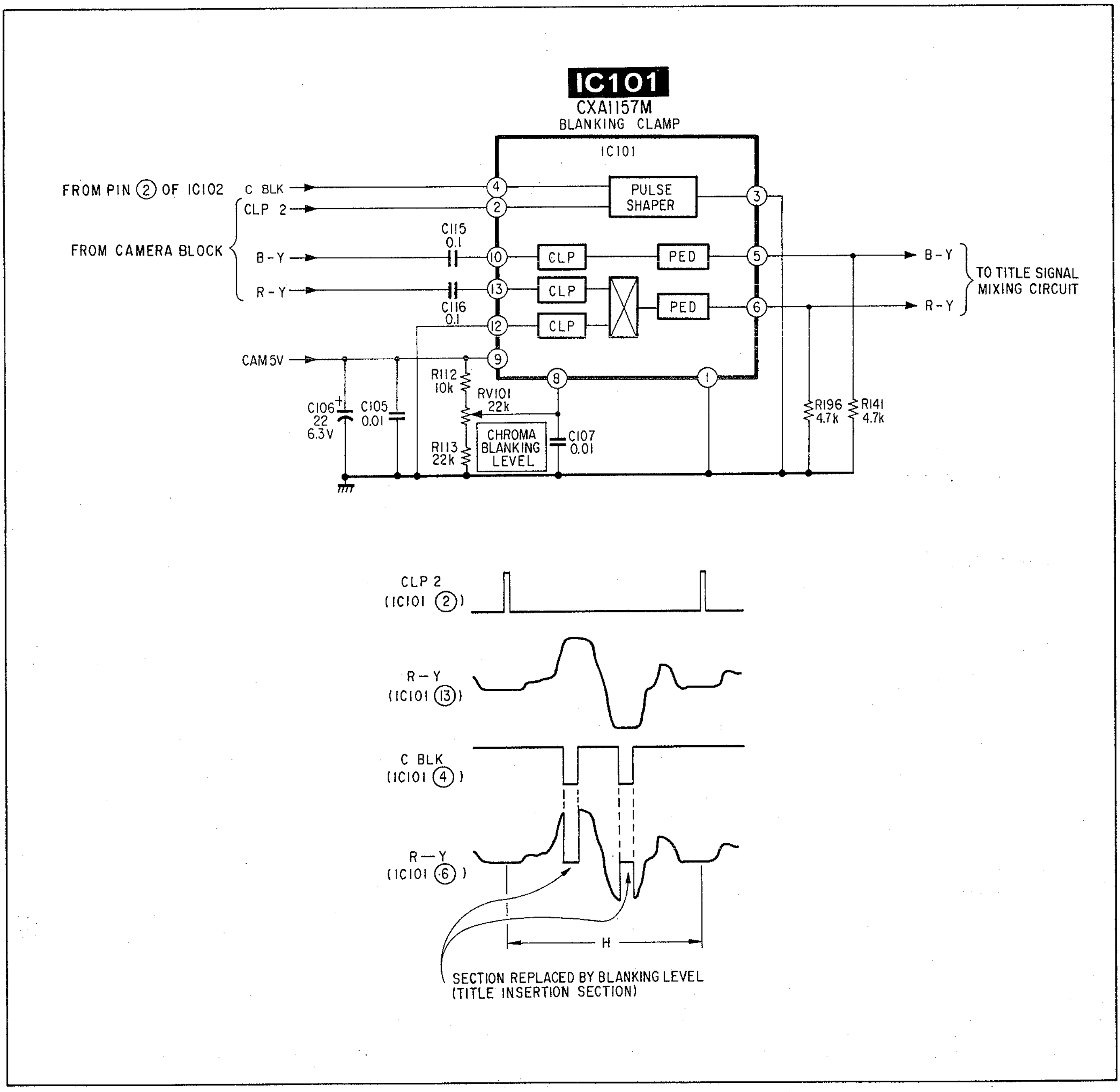

IC101
CXA1157M
BLANKING CLAMP
IC101
FROM PIN ② OF IC102
C BLK
CLP 2
FROM CAMERA BLOCK
B-Y
R-Y
C115
0.1
C116
0.1
PULSE SHAPER
CLP
CLP
CLP
PED
PED
④
②
⑩
⑬
⑫
⑨
⑧
①
③
⑤
⑥
B-Y
R-Y
TO TITLE SIGNAL MIXING CIRCUIT
CAM 5V
C106 22 6.3V
C105 0.01
R112 10k
RV101 22k
R113 22k
CHROMA BLANKING LEVEL
C107 0.01
R196 4.7k
R141 4.7k
CLP 2 (IC101 ②)
R−Y (IC101 ⑬)
C BLK (IC101 ④)
R−Y (IC101 ⑥)
H
SECTION REPLACED BY BLANKING LEVEL (TITLE INSERTION SECTION)

Fig. 1-6.

1-7. TITLE CHROMA SIGNAL MIXING CIRCUIT

[Objective]

The title signals R OUT, G OUT, and B OUT are mixed with the color difference signals from the camera block with title insertion sections blanked. As it is necessary at this time to convert the R OUT, G OUT, and B OUT signals to color difference signals, these three signals are matrixed to create a Y signal and mixed.

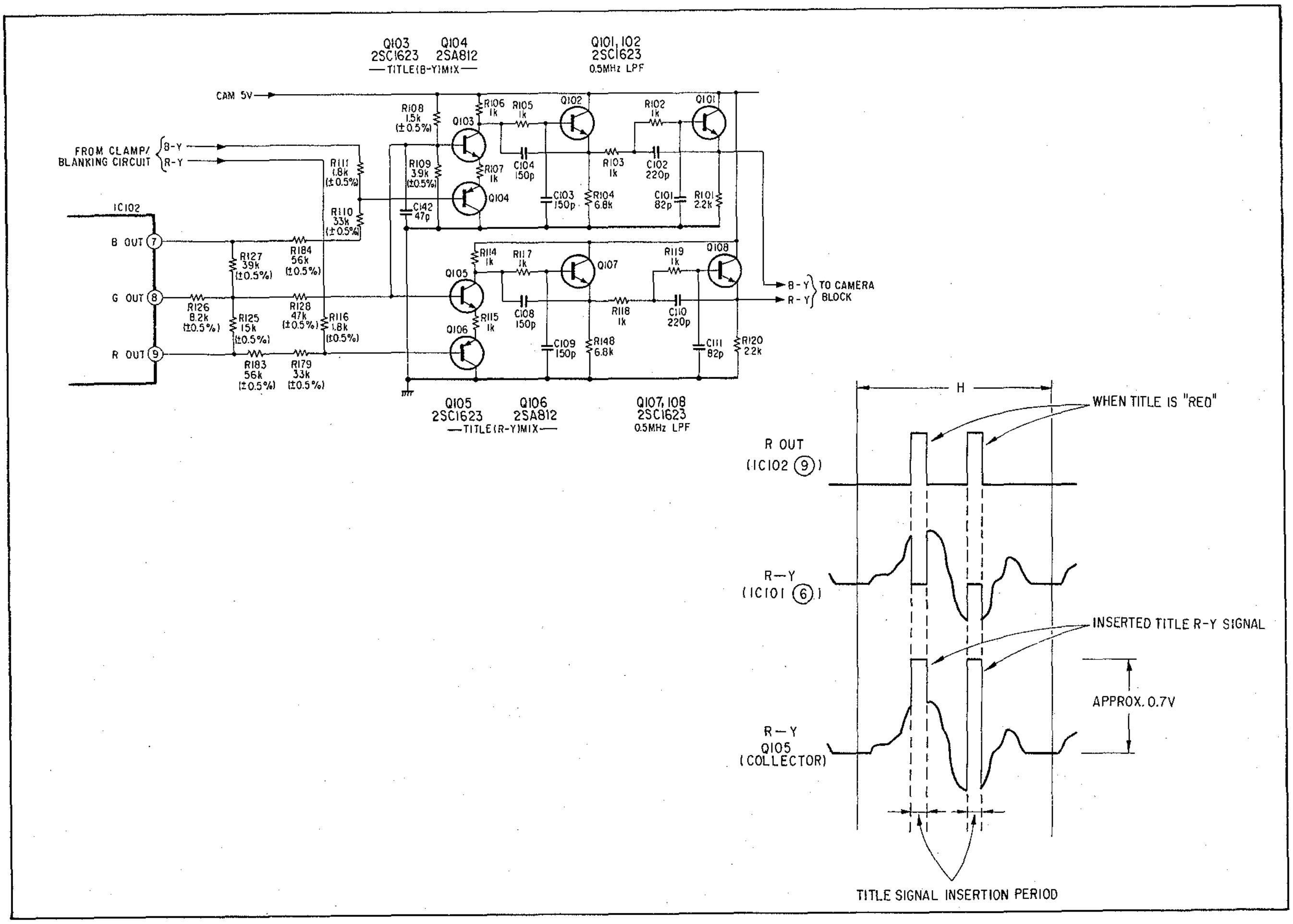
[Operation]

1. The color difference signals, R−Y and B−Y, from the camera block with the title insertion sections blanked are input respectively to the base of Q106 through R116 and to the base of Q104 through R111.
2. The title signals, R OUT and B OUT, are input respectively to the base of Q106 through R183 and R179, and to the base of Q104 through R184 and R110.
3. The title signals R OUT, G OUT, and B OUT are matrixed by R125, R126, and R127 at a ratio of R : G : B = 0.3 : 0.59 : 0.11 to form a title Y signal which is input to the bases of Q105 and Q103 through R128.
4. The title signals, R OUT and B OUT, input to the bases of Q106 and Q104 attenuate the title Y signal input to the base of Q105 or Q103, and output to the collector of Q105.

   Thus, the title R−Y signal can be obtained at the collector of Q105 and the title B−Y signal at the collector of Q103.

   The above is performed during the title insertion period.

   During other periods, the color difference signals R−Y and B−Y input to the base of Q106 and Q104 from the camera block are output unchanged from the collector of Q105 and Q103.
5. After the unnecessary frequency bandwidth of the color difference signals R−Y and B−Y with the title signals inserted is eliminated by the active LPF (cutoff frequency = approx. 500kHz) formed from Q107, 108 and Q102, 101, they are output to the camera block and encoded in the composite video signal.



Q103 2SC1623
Q104 2SA812
—TITLE(B-Y)MIX—
Q101, 102 2SC1623 0.5MHz LPF
CAM 5V
FROM CLAMP/ BLANKING CIRCUIT
B-Y
R-Y
IC102
B OUT ⑦
G OUT ⑧
R OUT ⑨
R108 1.5k (±0.5%)
R106 1k
R105 1k
R102 1k
R109 3.9k (±0.5%)
R107 1k
C104 150p
R103 1k
C102 220p
R111 1.8k (±0.5%)
R110 33k (±0.5%)
C142 47p
C103 150p
R104 6.8k
C101 82p
R101 2.2k
R127 39k (±0.5%)
R184 56k (±0.5%)
R126 8.2k (±0.5%)
R125 15k (±0.5%)
R128 47k (±0.5%)
R116 1.8k (±0.5%)
R183 56k (±0.5%)
R179 33k (±0.5%)
R114 1k
R117 1k
R119 1k
R115 1k
C108 150p
R118 1k
C110 220p
C109 150p
R148 6.8k
C111 82p
R120 2.2k
Q102
Q101
Q103
Q104
Q105
Q106
Q107
Q108
B-Y
R-Y
TO CAMERA BLOCK
Q105 2SC1623
Q106 2SA812
—TITLE(R-Y)MIX—
Q107, 108 2SC1623 0.5MHz LPF
H
WHEN TITLE IS "RED"
R OUT (IC102 ⑨)
R−Y (IC101 ⑥)
INSERTED TITLE R-Y SIGNAL
APPROX. 0.7V
R−Y Q105 (COLLECTOR)
TITLE SIGNAL INSERTION PERIOD

Fig. 1-7.

1-8. TITLE Y SIGNAL MIXING CIRCUIT

[Objective]

The title Y signal is mixed with the Y signal shot by the camera.

[Operation]

1. The Y BLK signal output from Pin ① of IC102 passes through R182 and R890, is input to Pin ㉚ of IC801 on the camera block VC-22 board, and the title insertion section of the camera Y signal is blanked.

   The Y BLK signal is "H" active and the signal is only "H" at the title section.

   When title insertion is not performed and at sections other than the title during title insertion, the voltage (approx. 2.7Vdc) set by RV807 is input to Pin ㉚ of IC801, and this sets the setup level of the camera output video signal to 25mV. As the Y BLK signal goes to "H" (approx. 5V) at the title sections, the voltage at Pin ㉚ of IC801 rises approx. 0.7V, the pedestal level of the camera Y signal drops, and the camera Y signal is blanked.
2. The title signals Y_R, Y_G, and Y_B output from IC102 are mixed at a ratio of $Y_R : Y_G : Y_B = 1 : 2 : 1$, and input to the emitter of Q801. The composite sync signal with negative polarity is input to the Q801 emitter, and the Y signal (negative polarity) with title section blanked is input to the base. Thus, a signal with the camera Y signal (positive polarity) mixed with the composite sync signal (negative polarity) and title Y signal is output to the Q801 collector.
3. The camera Y signal mixed with the composite sync signal and title Y signal passes through buffer Q807, and is input to the Q808 emitter. As 3.58MHz chroma signal (already mixed with title chroma signal) output from Pin ⑪ of IC801 is input to the Q808 emitter through the BPF, the final video signal with Y/C mixed is output to the Q808 collector.

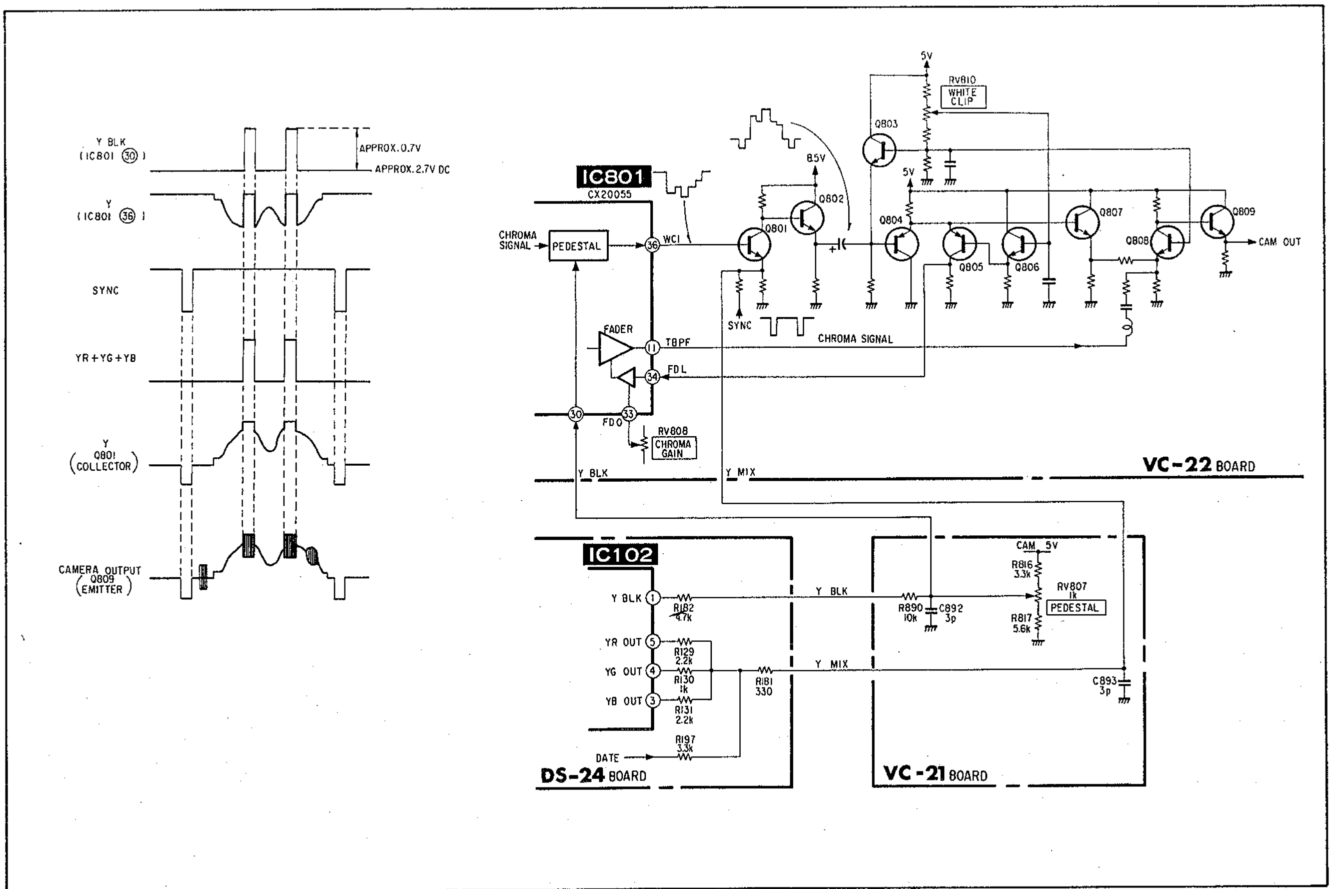

Y BLK
(IC801 ㉚)
APPROX.0.7V
APPROX.2.7V DC
Y
(IC801 ㊱)
SYNC
YR+YG+YB
Y
(Q801 COLLECTOR)
CAMERA OUTPUT
(Q809 EMITTER)
IC801
CX20055
CHROMA SIGNAL
PEDESTAL
㊱
WCI
FADER
⑪
TBPF
㉞
FDL
㉚
㉝
FDO
RV808
CHROMA GAIN
Y BLK
Y MIX
SYNC
CHROMA SIGNAL
8.5V
5V
RV810
WHITE CLIP
Q801
Q802
Q803
Q804
Q805
Q806
Q807
Q808
Q809
CAM OUT
VC-22 BOARD
IC102
Y BLK ①
R182
4.7k
YR OUT ⑤
R129
2.2k
YG OUT ④
R130
1k
YB OUT ③
R131
2.2k
R181
330
R197
3.3k
DATE
DS-24 BOARD
Y BLK
Y MIX
CAM 5V
R816
3.3k
RV807
1k
PEDESTAL
R890
10k
C892
3p
R817
5.6k
C893
3p
VC-21 BOARD

Fig. 1-8.

1-9. TIMING FOR TITLE STORAGE

1. Pin ㉝ of IC108 goes to "L" when the MEM button (S948 on SK board) is pressed in the CAMERA STANDBY mode.
2. The DDS/DT controller (IC108) immediately performs the following operation.
   1) If the IMPOSE signal (Pin ⑨ of IC108) is "H", it is returned to "L" to stop insertion of the title signal to the camera video signal.
   2) If the S RAM CS signal (Pin ⑦ of IC108) is "L", it is set to "H" to allow writing to the memory (IC103).
   3) Next, the DDS/DT controller sets the MEMO signal (Pin ⑧ of IC108) to "H" for 40msec. During this interval, the digital title process IC (IC102) is synchronized to the sync signal of the camera video signal, and 1 field of the camera video signal (title signal) is written to the memory (IC103).
4. The DDS/DT controller sets the IMPOSE signal to "H" 40msec after the MEMO signal falls ( ). Starting reading of the title signal from the memory (IC103) and insertion of the read signal into the camera video signal by the digital title process IC. This operation then continues until the IMPOSE ON/OFF button (S950 on SK board) is pressed.

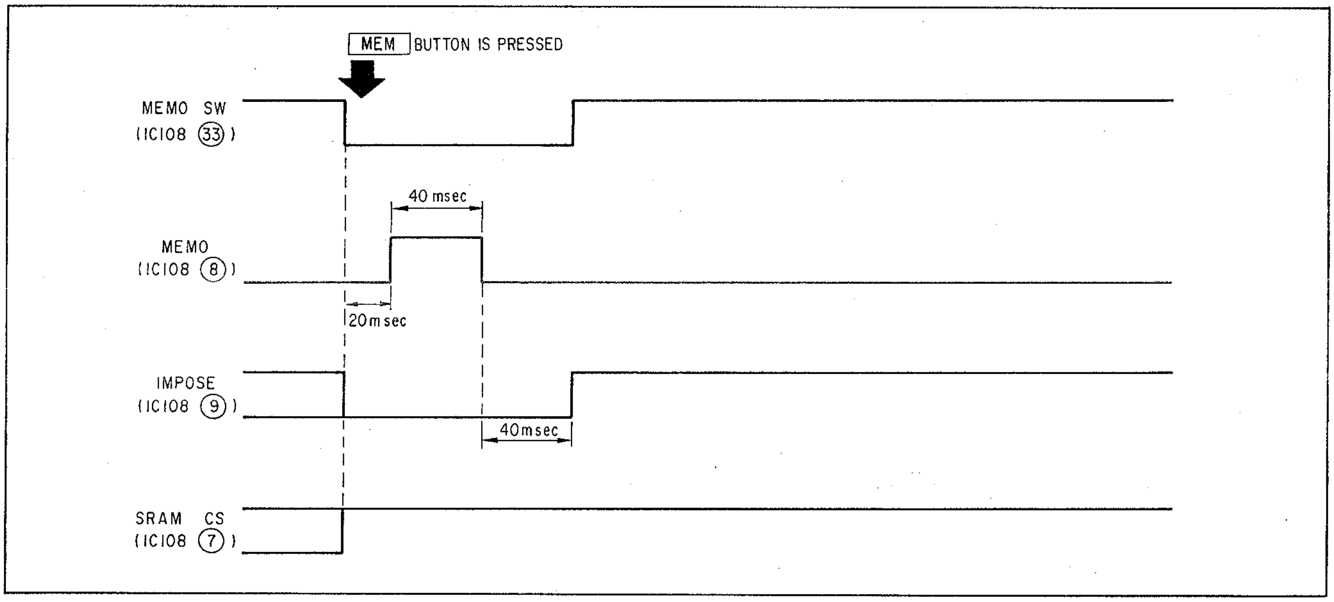


Fig. 1-9. Timing chart for title storage

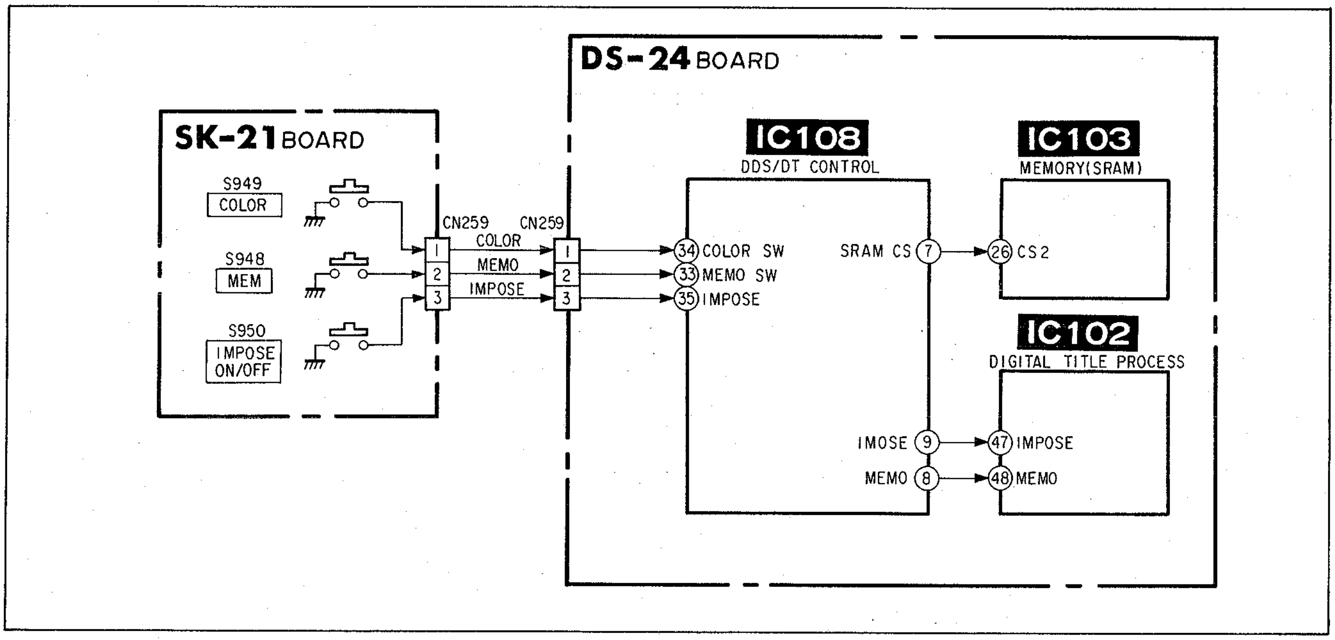

DS-24 BOARD
SK-21 BOARD
S949
COLOR
S948
MEM
S950
IMPOSE ON/OFF
CN259
CN259
COLOR
MEMO
IMPOSE
1
2
3
1
2
3
IC108
DDS/DT CONTROL
㉞ COLOR SW
㉝ MEMO SW
㉟ IMPOSE
SRAM CS ⑦
IMOSE ⑨
MEMO ⑧
IC103
MEMORY(SRAM)
㉖ CS2
IC102
DIGITAL TITLE PROCESS
㊼ IMPOSE
㊽ MEMO

Fig. 1-10.

1-10. TIMING FOR TITLE INSERTION

1. When the IMPOSE ON/OFF button (S950 on SK board) is pressed in the CAMERA REC mode, Pin ㉟ of IC108 goes to "L".
2. The DDS/DT controller (IC108) immediately sets the IMPOSE signal (Pin ⑨ of IC108) to "H" and the S RAM CS signal (Pin ⑦ of IC108) to "H", starting reading of the title signal from the memory (IC103) and insertion of the read signal into the camera video signal by the digital title process IC (IC102). This operation then continues until the IMPOSE ON/OFF button is pressed.

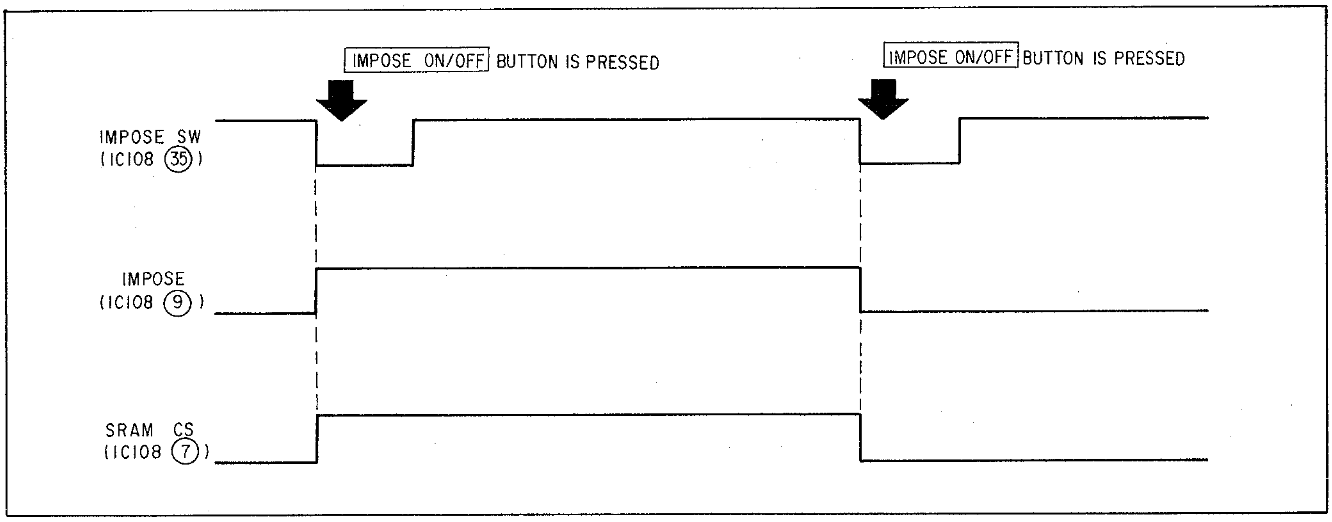


Fig. 1-11. Timing chart for title insertion ON/OFF

1-11. CLOCK GENERATION CIRCUIT FOR TITLER

[Objective]

This circuit generates a clock for the titler synchronized to the camera output video signal. If this clock is not synchronized to the camera output video signal, the vertical lines of the title will appear rough or waver on the screen.

[Operation]

1. The $\overline{\text{H SYNC}}$ signal separated from the camera video signal on the VI board passes through the delay circuit configured from Pins ⑧ to ⑬ of IC113, R199, and C141, and is input to Pin ② of IC113.
2. The $\overline{\text{H SYNC}}$ signal is a pulse which is "L" during the horizontal sync signal period. Thus, the clock oscillation circuit of Pins 1 to 3 of IC113 stops oscillation during the horizontal sync signal period and starts oscillation synchronized to the rising edge of the $\overline{\text{H SYNC}}$ signal. This synchronizes the clock to the horizontal sync signal.

※ The delay circuit is a circuit causes clock oscillation to start after $\overline{\text{H SYNC}}$ has risen completely.

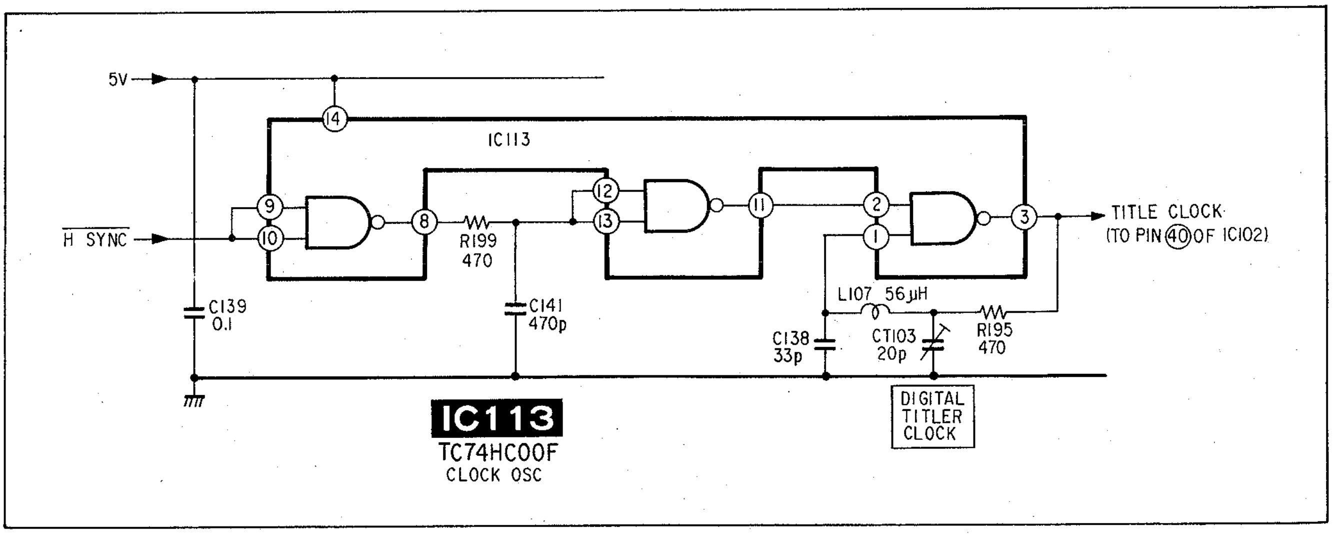


Fig. 1-12

1-12. V ADDRESS GENERATION

[Operation]

1. The vertical sync signal REF V separated from the camera output video signal is input to Pin ㊱ of IC102.
2. REF V signal synchronization is attained by the rising edge of the horizontal sync signal $\overline{\text{H SYNC}}$ (Pin ㊲ of IC102), and this becomes the $\overline{V_P}$ pulse ("L" active). The pulse width of the $\overline{V_P}$ pulse is 1/2 that of the horizontal sync. The $\overline{\text{H SYNC}}$ signal is a composite sync signal separated from the camera output video signal.
3. The $\overline{V_P}$ pulse is input to the V counter for V address generation and the V address is reset to "0".
4. The V counter counts the falling edge of $\overline{\text{H SYNC}}$. After reset by the $\overline{V_P}$ pulse, the V address is kept at "0" for 20 counts in NTSC models or 37 counts in PAL models, and following this, the V address is incremented each time a falling edge of $\overline{\text{H SYNC}}$ is input.
5. Incrementation of the V counter stops when the V address reaches 236 for NTSC or 255 for PAL, and the V address is retained until the $\overline{V_P}$ pulse is input again.

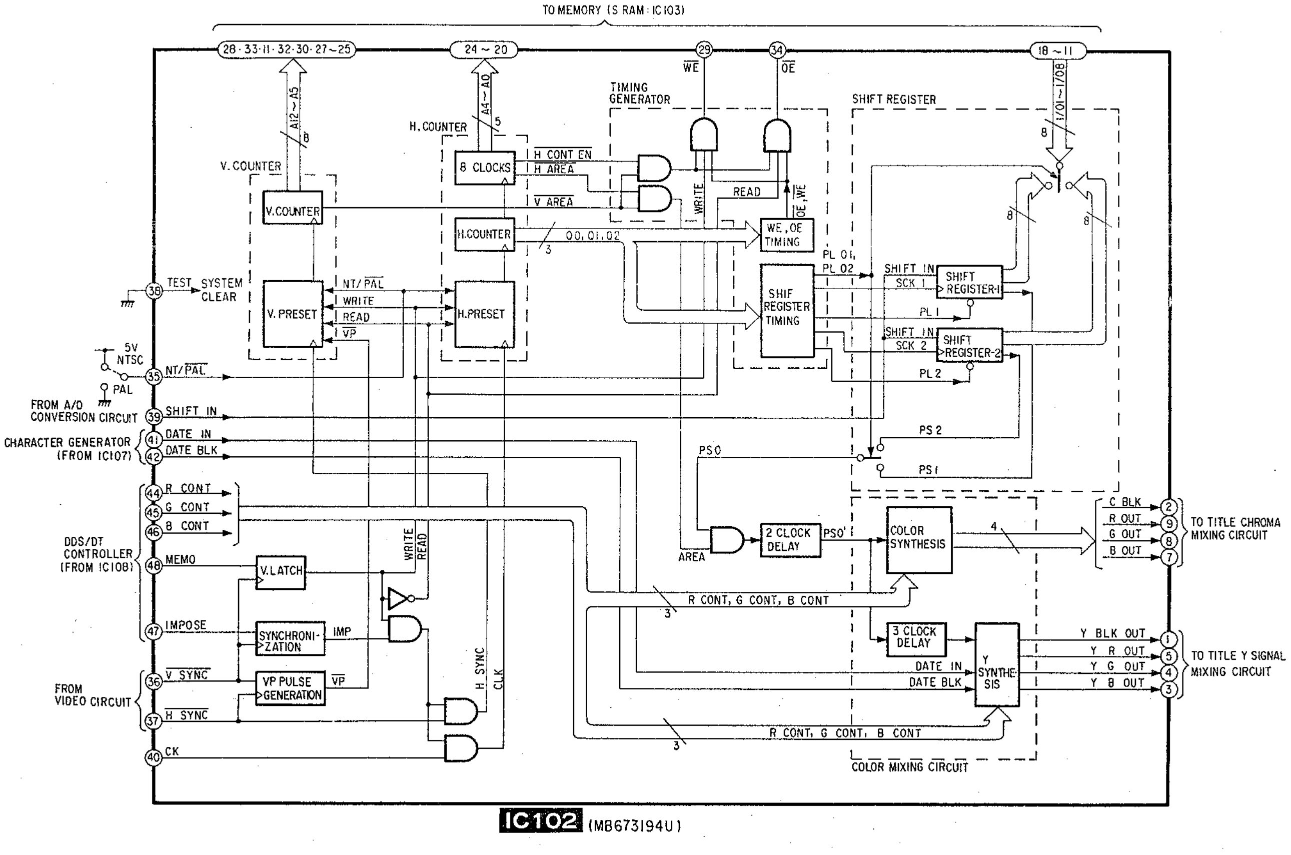

TO MEMORY (S RAM: IC103)
28·33·11·32·30·27~25
24~20
29
34
18~11
A12~A5
8
A4~A0
5
WE
OE
I/O1~I/O8
TIMING GENERATOR
SHIFT REGISTER
H. COUNTER
V. COUNTER
8 CLOCKS
H CONT EN
H AREA
V AREA
V.COUNTER
H.COUNTER
00, 01, 02
3
WRITE
READ
OE, WE
WE, OE TIMING
SHIF REGISTER TIMING
PL 01, PL 02
SHIFT IN
SCK 1
SHIFT REGISTER-1
PL 1
SHIFT IN
SCK 2
SHIFT REGISTER-2
PL 2
PS 2
PS 1
PS 0
TEST
SYSTEM CLEAR
V. PRESET
H.PRESET
NT/PAL
WRITE
READ
VP
5V
NTSC
PAL
FROM A/D CONVERSION CIRCUIT
SHIFT IN
CHARACTER GENERATOR (FROM IC107)
DATE IN
DATE BLK
R CONT
G CONT
B CONT
DDS/DT CONTROLLER (FROM IC108)
MEMO
V.LATCH
IMPOSE
SYNCHRONIZATION
IMP
FROM VIDEO CIRCUIT
V SYNC
VP PULSE GENERATION
VP
H SYNC
CK
H SYNC
CLK
AREA
2 CLOCK DELAY
PS0'
COLOR SYNTHESIS
4
R CONT, G CONT, B CONT
3 CLOCK DELAY
DATE IN
DATE BLK
Y SYNTHESIS
R CONT, G CONT, B CONT
COLOR MIXING CIRCUIT
C BLK
R OUT
G OUT
B OUT
TO TITLE CHROMA MIXING CIRCUIT
Y BLK OUT
Y R OUT
Y G OUT
Y B OUT
TO TITLE Y SIGNAL MIXING CIRCUIT
38
35
39
41
42
44
45
46
48
47
36
37
40
2
9
8
7
1
5
4
3
IC102 (MB673194U)

Fig. 1-13. IC102 (MB673194U) internal block diagram

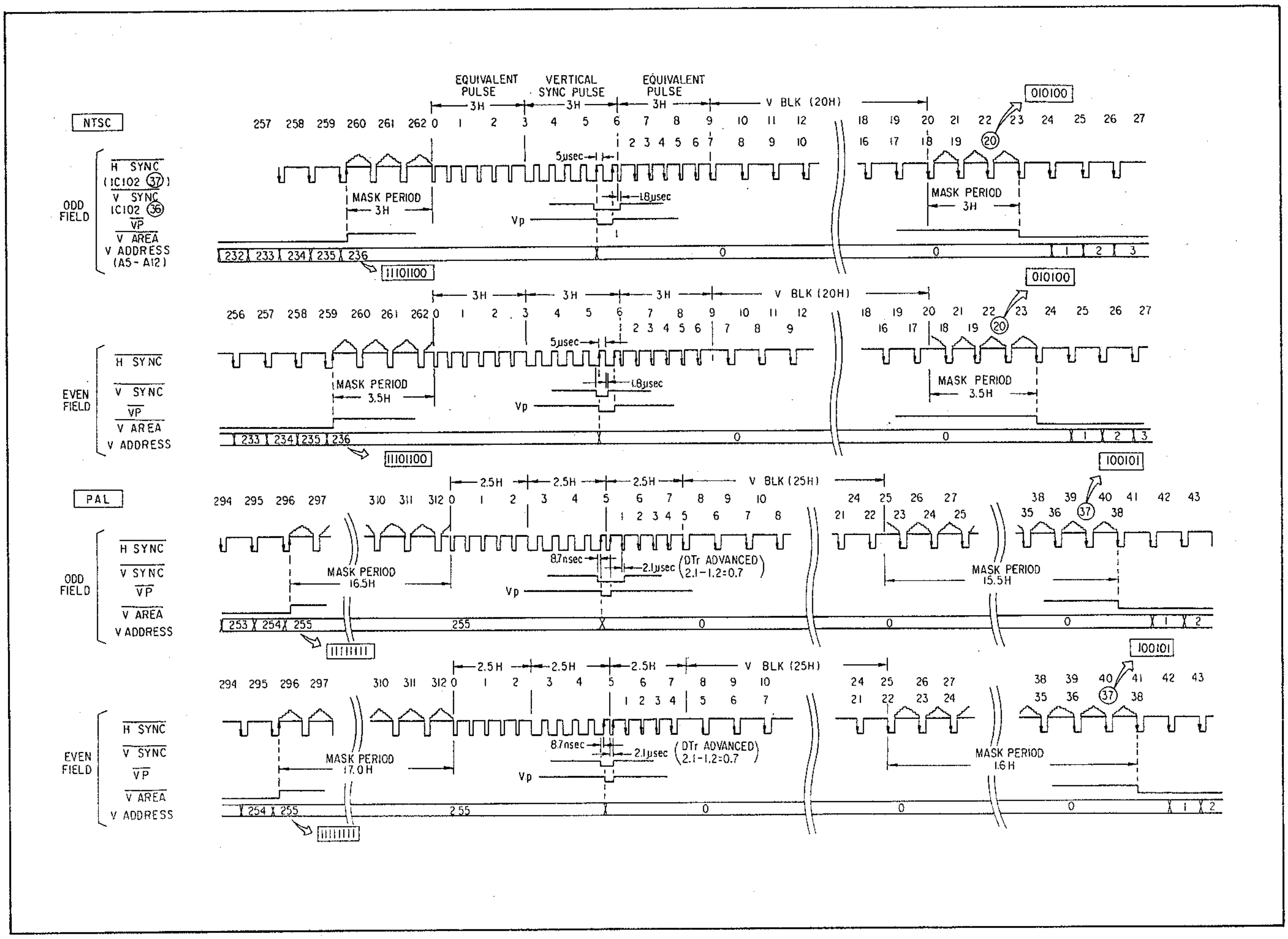

NTSC
ODD FIELD
H SYNC (IC102 ㊲)
V SYNC IC102 ㊱
VP
V AREA
V ADDRESS (A5-A12)
EQUIVALENT PULSE
VERTICAL SYNC PULSE
EQUIVALENT PULSE
3H
V BLK (20H)
MASK PERIOD 3H
5μsec
1.8μsec
Vp
010100
11101100
⑳
EVEN FIELD
H SYNC
V SYNC
VP
V AREA
V ADDRESS
MASK PERIOD 3.5H
PAL
2.5H
V BLK (25H)
MASK PERIOD 16.5H
8.7nsec
2.1μsec
(DTr ADVANCED 2.1-1.2=0.7)
MASK PERIOD 15.5H
100101
11111111
㊲
MASK PERIOD 17.0H
MASK PERIOD 16H

Fig. 1-14. Read/write timing (vertical timing)

1-13. H ADDRESS GENERATION (FOR WRITE)

[Operation]

1. Titler clock oscillation is stopped while $\overline{\text{H SYNC}}$ (Pin ㊲ of IC102) is "L". Also, the H address (A0 to A4) is "0".
2. When $\overline{\text{H SYNC}}$ rises from "L" to"H", oscillation of the titler clock starts.
3. The titler clock (Pin ㊵ of IC102) is input to the H counter. and the H counter counts the rising edge of the titler clock.
4. After a count of 21 for NTSC or 28 for PAL by the H counter, SCK1 is output from the timing generator and sampling of the A-D Y signal to shift register 1 is performed. The H address remains at "0" at this time.
5. After the H counter is incremented another 8 counts, SCK1 is stopped, SCK2 is output instead, and sampling of the A-D Y signal to shift register 2 is performed. During this interval, the timing generator generates the $\overline{\text{WE}}$ pulse (Pin ㉙ of IC102) and the 8-bit data sampled in shift register 1 is written to the memory (IC103). The H address remains at "0" at this time.
6. After the H counter is incremented another 8 counts, SCK2 stops and SCK1 is output again in its place. This starts sampling of the A-D Y signal to shift register 1. At the same time, the H address is incremented to "1", and the 8-bit data sampled by shift register 2 is written to this memory address.
7. Subsequently, the H address is incremented each time the H counter is incremented by 8, and sampling of the A-D Y signals by shift registers 1 and 2 and writing to the memory are performed alternately.
8. When the H address reaches 31 and writing of the sampling data of shift register 2 is completed, the H address returned to "0", and state is maintained until writing of the next scan line (V address) starts.

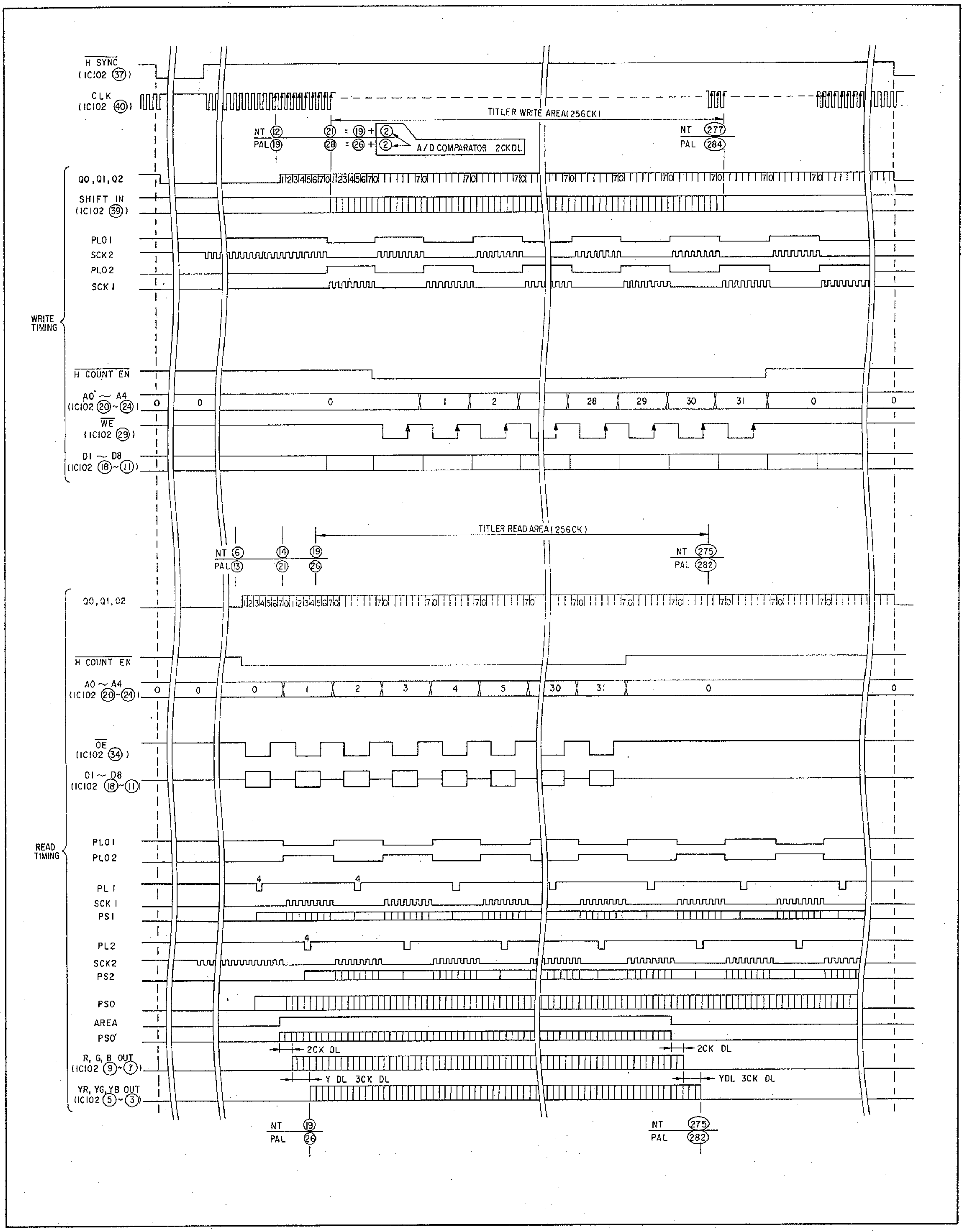

H SYNC (IC102 ㊲)
CLK (IC102 ㊵)
TITLER WRITE AREA(256CK)
NT ⑫ PAL ⑲
㉑ = ⑲ + ②
㉘ = ㉖ + ②
A/D COMPARATOR 2CKDL
NT 277 PAL 284
WRITE TIMING
Q0, Q1, Q2
SHIFT IN (IC102 ㊴)
PLO1
SCK2
PLO2
SCK1
H COUNT EN
A0 ~ A4 (IC102 ⑳~㉔)
WE (IC102 ㉙)
DI ~ D8 (IC102 ⑱~⑪)
TITLER READ AREA(256CK)
NT ⑥ PAL ⑬
⑭ ㉑
⑲ ㉖
NT 275 PAL 282
READ TIMING
OE (IC102 ㉞)
PL1
PS1
PL2
PS2
PS0
AREA
PS0'
2CK DL
R, G, B OUT (IC102 ⑨~⑦)
Y DL 3CK DL
YDL 3CK DL
YR, YG, YB OUT (IC102 ⑤~③)

Fig. 1-15. Write/read timing (horizontal timing)

1-14. H ADDRESS GENERATION (FOR READ)

[Operation]

1. While $\overline{\text{H SYNC}}$ (Pin ㊲ of IC102) is "L", oscillation of the titler clock is stopped. The H address (A0 to A4) is "0".
2. When $\overline{\text{H SYNC}}$ rises from "L" to "H", oscillation of the titler clock starts.
3. The titler clock is input to the H counter, and the H counter counts the rising edge of the titler clock.
4. After a count of 14 for NTSC or 21 for PAL by the H counter, data is read from the memory (IC103),and serial output of the 8-bit data (data stored in H address "0") written in shift register 1 starts. At the same time, the H address is incremented to "1".
5. While title data is read one bit at a time (serial output) from shift register 1 synchronized to SCK 1, the 8-bit data of H address "1" is read into shift register 2 from the memory (IC103). The control signal for memory read is the $\overline{\text{OE}}$ signal (Pin ㉞ of IC102).
6. When reading of the 8-bit data from shift register 1 is completed, SCK1 stops and SCK2 is output in its place to start the output of title data from shift register 2. At the same time, the H address is incremented to become "2", and memory data is written to shift register 1.
7. This operation continues until the H address become "31". The H address then becomes "0" and this state is maintained until the next scan line. Title data output stops after the output of H address "31" data written in shift register 2.

1-15. GENERATION OF DDS CHARACTER AND COLOR SIG CHARACTER SIGNALS

The DDS/DT controller (IC108) transfers data to the character generator (IC107) and generates the DATE signal for DDS (date and time) and COLOR SIG signal for title color display.

This DATE signal consists of the DATE IN signal and DATE BLK signal, and these pass through the digital title process IC (IC102) and are mixed with the camera video signal. The COLOR SIG signal is alphabetic (3 to 4 characters) for displaying the title color in the EVF (electronic viewfinder), and is only mixed with the video signal for the EVF. As both the DATE signal and COLOR SIG signal are output from the same terminal of the character generator (IC107), a timing signal for separating these signals is generated by IC106. In other words, Pins ④ and ⑩ of IC105 are "L" and Pin ① of IC105 is "H" for the top and center portions of the screen so that the COLOR SIG is mixed with the video signal for the EVF, and Pins ④ and ⑩ of IC105 are "H" and Pin ① of IC105 is "L" for the bottom portion of the screen so that the DATE signal is mixed with the camera video signal.

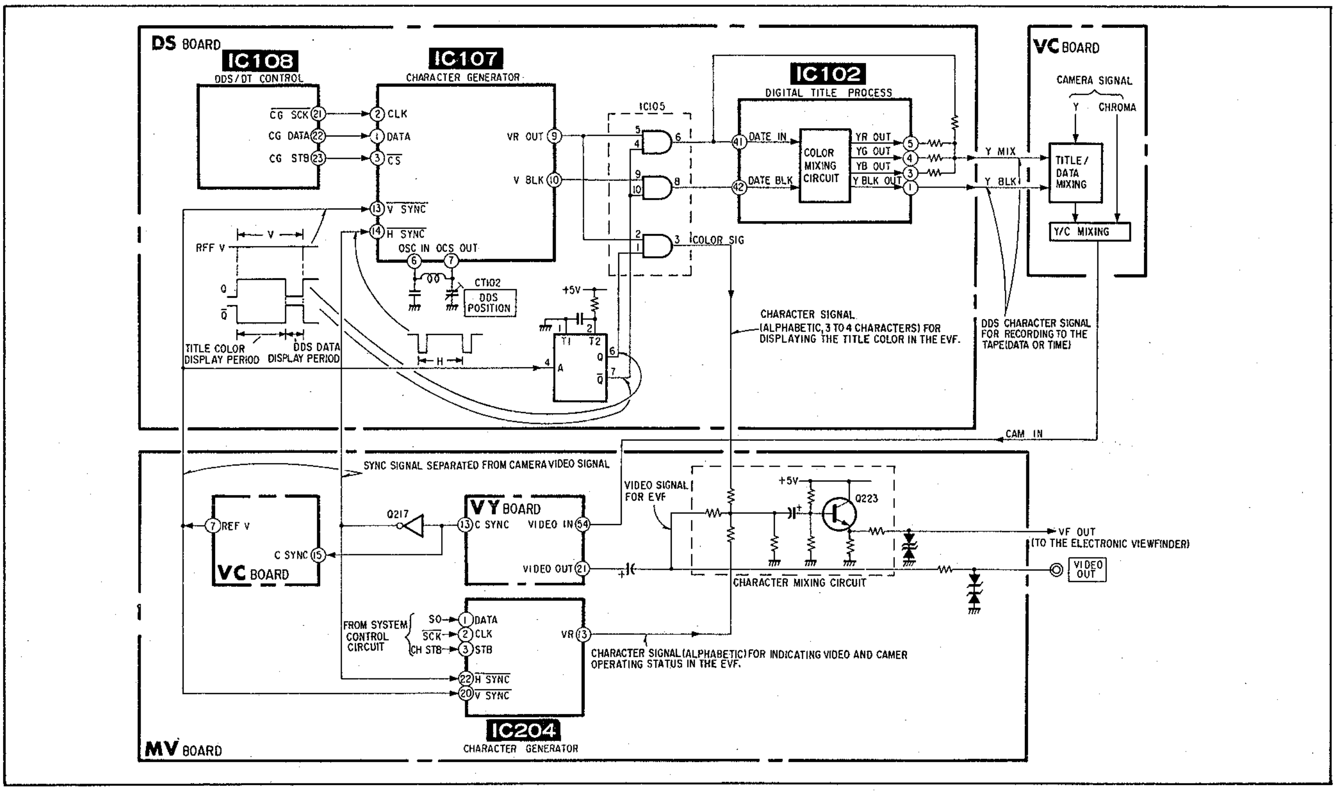

DS BOARD
IC108
DDS/DT CONTROL
CG SCK ㉑
CG DATA ㉒
CG STB ㉓
IC107
CHARACTER GENERATOR
② CLK
① DATA
③ CS
VR OUT ⑨
V BLK ⑩
⑬ V SYNC
⑭ H SYNC
OSC IN
OCS OUT
⑥
⑦
CT102
DDS POSITION
RFF V
V
Q
Q
TITLE COLOR DISPLAY PERIOD
DDS DATA DISPLAY PERIOD
H
+5V
T1
T2
A
IC105
COLOR SIG
IC102
DIGITAL TITLE PROCESS
㊶ DATE IN
㊷ DATE BLK
COLOR MIXING CIRCUIT
YR OUT ⑤
YG OUT ④
YB OUT ③
Y BLK OUT ①
Y MIX
Y BLK
VC BOARD
CAMERA SIGNAL
Y
CHROMA
TITLE/DATA MIXING
Y/C MIXING
CHARACTER SIGNAL (ALPHABETIC, 3 TO 4 CHARACTERS) FOR DISPLAYING THE TITLE COLOR IN THE EVF.
DDS CHARACTER SIGNAL FOR RECORDING TO THE TAPE(DATA OR TIME)
CAM IN
SYNC SIGNAL SEPARATED FROM CAMERA VIDEO SIGNAL
⑦ REF V
C SYNC ⑮
VC BOARD
Q217
VY BOARD
⑬ C SYNC
VIDEO IN 54
VIDEO OUT ㉑
VIDEO SIGNAL FOR EVF
+5V
Q223
CHARACTER MIXING CIRCUIT
VF OUT (TO THE ELECTRONIC VIEWFINDER)
VIDEO OUT
FROM SYSTEM CONTROL CIRCUIT
SO
SCK
CH STB
① DATA
② CLK
③ STB
VR ⑬
㉒ H SYNC
⑳ V SYNC
CHARACTER SIGNAL (ALPHABETIC) FOR INDICATING VIDEO AND CAMER OPERATING STATUS IN THE EVF.
IC204
CHARACTER GENERATOR
MV BOARD

Fig. 1-16.

1-16. DIGITAL PROCESS IC
(IC102 : MB673194U)

1) Process — C MOS gate array
   Scale — 850 gates × 90%
   Package — 48-pin flat package
   Input level — C MOS level

2) Recommended operating conditions
   V_{DD} — 5V ±5%
   Ambient temperature — 0 to +70°C

3) Memory method — Field memory interlace

4) Clock frequency — (Refer to Fig. 1-17.)
   NTSC — 5.158 MHz
   PAL — 5.229 MHz

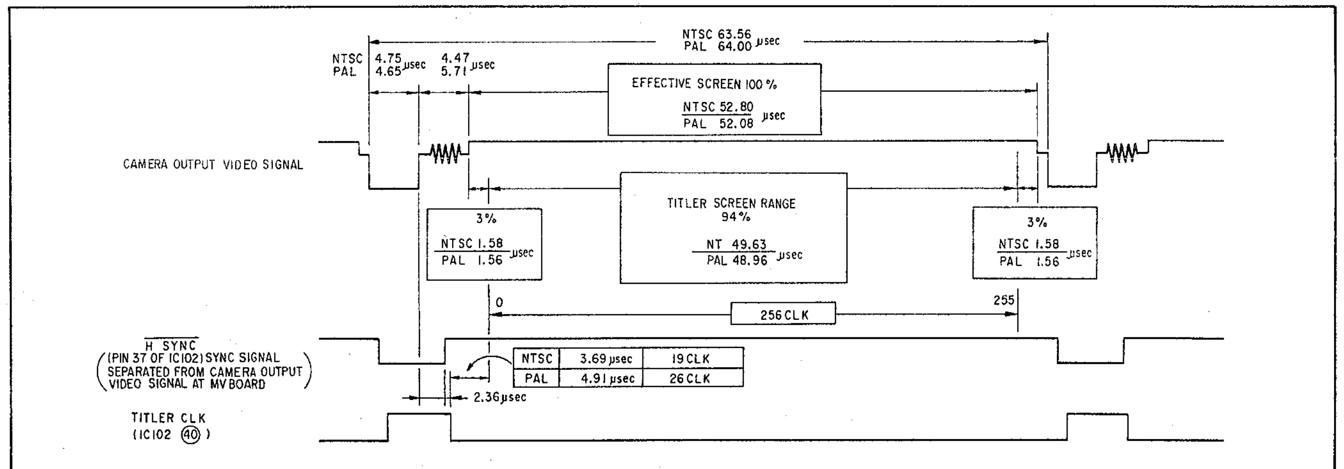
5) Memory capacity — Single title with 64k S RAM
   NTSC — 256 clocks × 236H
   PAL — 256 clocks × 256H

6) Title screen range (Refer to Fig. 1-18.)
   V direction
   NTSC — 236H(approx. 3H on top and bottom masked)
   PAL — 256H(approx. 16H on top and bottom masked)
   H direction — 94% of effective screen

7) Titler input — 1-bit quantized data

8) Titler output
   - Y and chroma system RGB output (including blanking output)
   - Y system is delayed 3 clocks from chroma system
   - 8 color display by R-G-B selection Red, green, blue, cyan, magenta, yellow, black, white

9) Character generator simultaneous display
   - Two input : Date IN and Date BLK, can be bordered


NTSC 63.56 μsec
PAL 64.00
NTSC 4.75 μsec
PAL 4.65
4.47 μsec
5.71
EFFECTIVE SCREEN 100%
NTSC 52.80 μsec
PAL 52.08
CAMERA OUTPUT VIDEO SIGNAL
TITLER SCREEN RANGE 94%
NT 49.63 μsec
PAL 48.96
3%
NTSC 1.58 μsec
PAL 1.56
3%
NTSC 1.58 μsec
PAL 1.56
0
256CLK
255
H SYNC (PIN 37 OF IC102) SYNC SIGNAL SEPARATED FROM CAMERA OUTPUT VIDEO SIGNAL AT MV BOARD
NTSC 3.69 μsec 19CLK
PAL 4.91 μsec 26CLK
2.36μsec
TITLER CLK (IC102 ㊵)

Titler CLK frequency		
	f_{NTSC}	$\frac{1}{49.63\mu sec \div 256} = \frac{1}{193.8 nsec} = 5.158$ MHz
	f_{PAL}	$\frac{1}{48.96\mu sec \div 256} = \frac{1}{191.2 nsec} = 5.229$ MHz

Titler start CLK number		
	NTSC	$\frac{3.69\mu sec}{193.8 nsec} \fallingdotseq 19$CLK
	PAL	$\frac{4.91\mu sec}{191.2 nsec} \fallingdotseq 26$CLK

Fig. 1-17. H counter timing chart

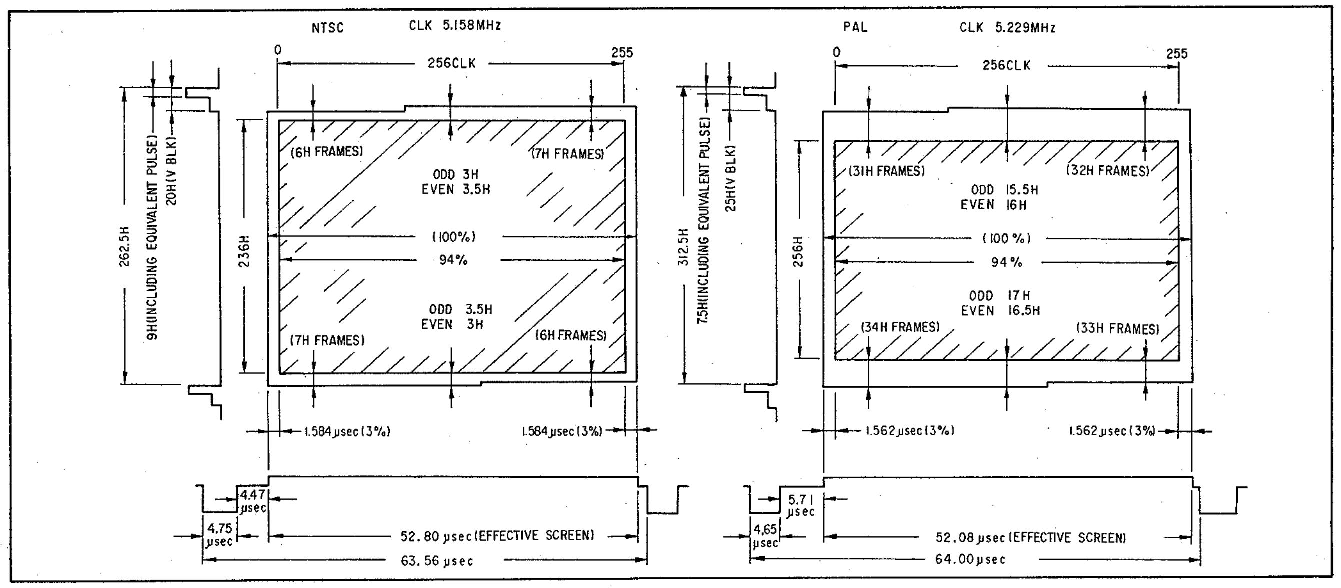

NTSC
CLK 5.158MHz
0
256CLK
255
262.5H
9H(INCLUDING EQUIVALENT PULSE)
20H(V BLK)
236H
(6H FRAMES)
(7H FRAMES)
ODD 3H
EVEN 3.5H
(100%)
94%
ODD 3.5H
EVEN 3H
(7H FRAMES)
(6H FRAMES)
1.584μsec(3%)
1.584μsec(3%)
4.47 μsec
4.75 μsec
52.80μsec(EFFECTIVE SCREEN)
63.56μsec
PAL
CLK 5.229MHz
0
256CLK
255
312.5H
7.5H(INCLUDING EQUIVALENT PULSE)
25H(V BLK)
256H
(31H FRAMES)
(32H FRAMES)
ODD 15.5H
EVEN 16H
(100%)
94%
ODD 17H
EVEN 16.5H
(34H FRAMES)
(33H FRAMES)
1.562μsec(3%)
1.562μsec(3%)
5.71 μsec
4.65 μsec
52.08μsec(EFFECTIVE SCREEN)
64.00μsec

Fig. 1-18. Title screen range

10) Pin functions

Signal	Pin No.	I/O	Functions
D1 ∼ D8	18 ∼ 11	I/O ∼ I/O	Connected to data bus of 64k S RAM (static RAM) or 256k S RAM
A0 ∼ A12	20 ∼ 27 30 32 10 33	O ∼ O	Connected to address bus of 64k S RAM or 256k S RAM
$\overline{\text{WE}}$	29	O	Connected to RAM $\overline{\text{WE}}$ pin. Write timing signal.
$\overline{\text{OE}}$	34	O	Connected to RAM $\overline{\text{OE}}$ pin. Read timing signal.
IMPOSE	47	I	Data read from RAM while this signal is "H" (latched by falling edge "‾↓_" of $\overline{\text{V SYNC}}$ signal), and titler signal is output.
MEMO	48	I	One field of titler input data is written to the RAM by the rising edge of this signal "_↑‾" (when IMPOSE signal is "L")
$\overline{\text{V SYNC}}$	36	I	REF V signal output from Pin ③ of chroma sync IC CX23054 (in VC-10 on MV-11 board for NTSC) (in VC-11 on MV-12 board for PAL) is input. REF V signal is "L" at V SYNC section.
$\overline{\text{H SYNC}}$	37	I	COMP SYNC signal output from Pin ② of Y signal processing IC CX20030 (in VY-8 on MV-11 board for NTSC) (in VY-9 on MV-12 board for PAL) is inverted and input as $\overline{\text{H SYNC}}$ signal. $\overline{\text{H SYNC}}$ signal is "L" at H SYNC section.
CLK	40	I	NTSC·········5.158 MHz (193.8 nsec period) PAL ·········5.229 MHz (191.2 nsec period) This CLK signal is synchronized to $\overline{\text{H SYNC}}$
SHIFT IN	39	I	Titler input data. Y signal is 1-bit A-D converted signal. "H" active.
DATE IN	41	I	DATE signal from character generator is input. "H" active.
DATE BLK	42	I	Input signal from character generator. DATE signal border signal. "H" active.
R CONT	44	I	Title color designation signal (R). User designates color by S949 on SK board. 8 colors can be designated by combining these three signals. "H" active.
G CONT	45	I	Title color designation signal (G). User designates color by S949 on SK board.
B CONT	46	I	Title color designation signal (B). User designates color by S949 on SK board.
R OUT	9	O	RGB title output signal (R). 8 colors can be output by combinig these three signals. "H" active.
G OUT	8	O	RGB title output signal (G).
B OUT	7	O	RGB title output signal (B).
Y RO	5	O	Title output signal for Y signal (R). Signals created by delaying R OUT, G OUT, and B OUT 3 CLK and combining with DATE IN signal and DATE BLK signal. "H" active.
Y GO	4	O	Title output signal for Y signal (G).
Y BO	3	O	Title output signal for Y signal (B).
C BLK	2	O	Color blanking output. "L" active.
Y BLK	1	O	Y blanking output. "H" active.
NT/PAL	35	I	NTSC when "H", PAL when "L".
TEST	38	I	Reset by "L". Normally "H".
V_{DD}	43 19	—	5VDC
V_{SS}	31	—	GND

Table 1-1.

1-17. DDS/DT CONTROLLER (IC108: μPD7508BGB-502)

1-17-1. Pin Functions

<table>
<tr><th>Signal</th><th>Pin No.</th><th>I/O</th><th>Functions</th></tr>
<tr><td>41/$\overline{42}$</td><td>1</td><td>I</td><td>Function select input for character generator.
“L”……μPD6142
“H”……μPD6141
Fixed at “L” as this unit uses the μPD6142.</td></tr>
<tr><td>BAT PRE-END</td><td>2</td><td>I</td><td>Battery pre-end detection input for lithium battery.
Goes to “H” when lithium battery is less than 2.8 Vdc.</td></tr>
<tr><td>DATE 0</td><td>3</td><td>I</td><td rowspan="2">DATE 0 Selection input for date and time display method
<table>
<tr><th>DATE 0</th><th>DATE 1</th><th>Date</th><th>Time</th></tr>
<tr><td>L</td><td>L</td><td>Day ␣ Month ␣ Year</td><td>24-hour system</td></tr>
<tr><td>L</td><td>H</td><td>Year ␣ Month ␣ Day</td><td>24-hour system</td></tr>
<tr><td>H</td><td>L</td><td>Month ␣ Day ␣ Year</td><td>12-hour system</td></tr>
<tr><td>H</td><td>H</td><td>Year ␣ Month ␣ Day</td><td>12-hour system</td></tr>
</table></td></tr>
<tr><td>DATE 1</td><td>4</td><td>I</td></tr>
<tr><td>S RAM CS</td><td>7</td><td>O</td><td>Chip select signal for S RAM (static RAM: IC103).
“H” when reading and writing to S RAM.</td></tr>
<tr><td>MEMO</td><td>8</td><td>O</td><td>Title memory signal. Title signal is stored in the memory by the rising edge of this signal “_↑‾”. This signal goes to “H” for 40 msec when the MEM button (S948) on the SK board is pressed in the camera standby mode (RP PB MODE= “H”).</td></tr>
<tr><td>IMPOSE</td><td>9</td><td>O</td><td>Title display ON signal. “H” when title display. This signal changes between “H” and “L” each time the IMPOSE ON/OFF button (S950) on the SK board is pressed.</td></tr>
<tr><td>R CONT</td><td>14</td><td>O</td><td rowspan="3">Title color selection signal. The original state is “white”, but the color changes as shown below each time the COLOR button (S949) on the SK board is pressed.
<table>
<tr><td>Color</td><td>└→White→</td><td>Blue →</td><td>Green→</td><td>Cyan →</td><td>Red →</td><td>Violet→</td><td>Yellow→</td><td>Black─┘</td></tr>
<tr><td>EVF indication</td><td>WHT</td><td>BLUE</td><td>GRN</td><td>CYAN</td><td>RED</td><td>VIO</td><td>YEL</td><td>BLK</td></tr>
<tr><td>R CONT</td><td>H</td><td>L</td><td>L</td><td>L</td><td>H</td><td>H</td><td>H</td><td>L</td></tr>
<tr><td>G CONT</td><td>H</td><td>L</td><td>H</td><td>H</td><td>L</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>B CONT</td><td>H</td><td>H</td><td>L</td><td>H</td><td>L</td><td>H</td><td>L</td><td>L</td></tr>
</table></td></tr>
<tr><td>G CONT</td><td>13</td><td>O</td></tr>
<tr><td>B CONT</td><td>10</td><td>O</td></tr>
<tr><td>RESET</td><td>15</td><td>I</td><td>This pin is set to “H” and the DDS/DT controller is reset by the voltage detection IC (IC112) and Q117 when the power voltage of the DDS/DT controller drops below 2.5 Vdc.</td></tr>
<tr><td>CL1</td><td>16</td><td>I</td><td rowspan="2">Pins for system clock oscillation
Normal oscillation frequency……approx. 330 kHz (6 μsec period)
Oscillation frequency when backed up by lithium battery……approx. 70 kHz (29 μsec period)</td></tr>
<tr><td>CL2</td><td>18</td><td>O</td></tr>
<tr><td>RP PB MODE</td><td>20</td><td>I</td><td>CAMERA STANDBY …………“H”, writing of title signal to memory enabled
CAMERA REC …………………“L”, writing of title signal to memory disabled</td></tr>
<tr><td>$\overline{\text{CG SCK}}$</td><td>21</td><td>O</td><td>Clock for transfer of serial data to character generator. In test mode, the system clock is divided by two and output.</td></tr>
<tr><td>CG DATA</td><td>22</td><td>O</td><td>Serial data to character generator.</td></tr>
<tr><td>CG STB</td><td>25</td><td>O</td><td>Strobe signal for transfer of serial data to character generator.
Strobe pulse……___⎍___</td></tr>
<tr><td>DATE/UP</td><td>29</td><td>I</td><td>DATE (+) button (S946 of SW board) input. “L” when button pressed.</td></tr>
<tr><td>TIME/ SHIFT</td><td>30</td><td>I</td><td>TIME (NEXT) button (S947 on SW board) input. “L“ when button is pressed.</td></tr>
<tr><td>$\overline{\text{CAM}}$ $\overline{\text{POWER}}$</td><td>32</td><td>I</td><td>“L” when camera power ON.
Operation mode selection signal for DDS/DT controller
“L”………constant mode
“H”………power save mode</td></tr>
</table>

Table 1-2. (1)

Signal	Pin No.	I/O	Functions
MEMO SW	33	I	MEM button (S948 on SK board) input. “L” when button is pressed.
COLOR SW	34	I	COLOR button (S949 on SK board) input. “L” when button is pressed.
IMPOSE SW	35	I	IMPOSE ON/OFF button (S950 on SK board) input. “L” when button is pressed.
$\overline{\text{TEST}}$	36	I	Normally fixed at “H” level. TEST mode when this pin is set to “L”.
X1	38	I	Crystal oscillator pin for time clock. Oscillation frequency 32.768 kHz. Even if the main battery is not connected, this is backed up by the lithium battery for constant oscillation.
X2	39	O	
CHK	41	O	In test mode, time clock is divided by four and output.

Table 1-2. (2)

1-17-2. Power Supply Modes

The DDS/DT controller operation mode changes in the following manner according to the power supply mode.

Main battery	Power switch (S351 of SK board)	Command cycle	Operation mode	Operating power voltage
Installed	CAMERA position	High-speed	Constant	5V created from main battery power supply
	OFF or PLAY position	High-speed	Power saving	5V created from main battery power supply
Not installed (when backed up by the lithium battery)	Any position	Low-speed	Power saving	Lithium battery 3V

Command cycle	High-speed Approx. 6 μsec at approx. 330 kHz Low-speed Approx. 29 μsec at approx. 70 kHz
Power saving mode	The time is incremented once every 500 msec and the mode is STOP at other times.

1-17-3. Test Mode

1. Starting/execution conditions

- When the camera power is ON, the test starts when the $\overline{\text{TEST}}$ Pin (Pin ㊱ of IC108) is connected to GND.
- The test mode is released when the camera power is turned OFF.

2. Operation

(1) A divide-by-four signal (8192 Hz)that of clock (32.768kHz) for time clock is output to the CHK pin (pin ㊶).

(2) A divide-by-two signal (approx. 165 kHz) that of the system clock (approx. 330 kHz) is output to the $\overline{\text{CG SCK}}$ pin (Pin ㉑).

(3) 12 characters are displayed in the DDS (date or time) display column and title color display column (EVF only), corresponding to the depressed button.

Priority	Depressed button			Display characters
1	DATE (+) button (S946 of SW board)	DATE1 (IC108 ④)	DATE0 (IC108 ③)	
		L	L	1
		L	H	2
		H	L	3
		H	H	4
2	TIME (NEXT) button (S947 of SW board)			5
3	MEM button (S948 of SK board)			6
4	COLOR button (S949 of SK board)			7
5	IMPOSE ON/OFF button (S950 of SK board)			8
6	When no button is pressed			None

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